



National Institute on Alcohol Abuse and Alcoholism

National Institute on Alcohol Abuse and Alcoholism  
Division of Biometry and Epidemiology  
Alcohol Epidemiologic Data System

## **SURVEILLANCE REPORT #50**

### **TRENDS IN ALCOHOL-RELATED MORBIDITY AMONG SHORT-STAY COMMUNITY HOSPITAL DISCHARGES, UNITED STATES, 1979–97**

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## HIGHLIGHTS

This surveillance report, produced by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), presents alcohol-related morbidity data from 1979 to 1997. The data were obtained from the National Hospital Discharge Survey (NHDS), which is based on a national sample of hospital discharge episodes and is compiled by the National Center for Health Statistics (NCHS). In developing this report, population data from the U.S. Census Bureau, provided by NCHS, were used to calculate rates. Overall, the data show few significant changes over the 19-year period. The following are highlights of general trends and notable findings:

### Numbers and Rates

- In 1997 approximately 421,000 hospital discharge episodes for persons ages 15 and older had a first-listed alcohol-related diagnosis, and approximately 1.3 million discharge episodes had an all-listed alcohol-related diagnosis. These figures represent 20.2 first-listed and 64.5 all-listed alcohol-related discharges per 10,000 population. Although the first-listed rate has declined slightly in the past 5 years, the all-listed rate remains significantly higher than it was 5 years earlier.
- Alcohol dependence syndrome comprised the majority (49 percent) of first-listed diagnoses, followed by alcoholic psychoses (22 percent), cirrhosis of the liver (20 percent), and nondependent abuse of alcohol (9 percent). The relative ranks of first-listed alcohol-related diagnoses are fairly constant over the 19-year period; however, the percentage of alcohol dependence diagnoses has been declining in the past 2 years, with the percentages for alcoholic psychoses and nondependent use of alcohol diagnoses growing slightly.
- A substantial difference exists between rates based on first-listed and all-listed diagnoses. Over two-thirds (69 percent) of alcohol-related morbidity episodes in 1997 did not appear as a first-listed diagnosis. On average, first-listed alcohol-related diagnoses accounted for slightly less than one-half (43 percent) of alcohol-related diagnoses in the NHDS sample over the 19-year period.
- For all alcohol-related diagnoses except cirrhosis without mention of alcohol, hospital discharge rates continue to be higher for males than for females. Persons in the 45- to 64-year-old age group generally have the highest all-listed alcohol-related morbidity rates, although persons in the 25- to 44-year-old age group have higher rates of nondependent use of alcohol. Persons in the 15- to 24-year-old age group have the lowest alcohol-related morbidity rates.
- From 1985 to 1997 all-listed hospital discharge rates showed a clear upward trend for nondependent abuse of alcohol; an upward trend for first-listed nondependent use of alcohol discharge does not appear until the last 2 years of this time period.

### Average Length of Hospital Stay

- In 1997 alcohol-related diagnoses, in decreasing order of severity—as measured by average length of hospital stay—were cirrhosis (7.2 days, with 7.8 days for alcoholic cirrhosis), alcohol dependence syndrome (6.3 days), alcoholic psychoses (5.7 days), and nondependent abuse of alcohol (4.5 days). No statistically significant changes in average length of stay were observed between 1979 and 1997.

## INTRODUCTION

This is the ninth surveillance report in a series of surveillance reports on alcohol-related morbidity among patients discharged from short-stay community hospitals in the United States. Prepared by the Alcohol Epidemiologic Data System (AEDS), Division

of Biometry and Epidemiology, NIAAA, this report updates trends published in earlier surveillance reports (Caces, Stinson, and Dufour 1997; Caces, Stinson, and Dufour 1996; Caces, Stinson, and Dufour 1995; Caces, Stinson, and Dufour 1994; Caces and Dufour 1993; Caces, Stinson, and Noble 1992; Caces et al. 1991; Stinson and Williams 1987) and a

data reference manual (Stinson 1989).

These findings are intended to be useful to policymakers, health care providers, researchers, and other individuals concerned about the health effects of alcohol abuse. The report includes numbers and population-based rates for hospital discharges with principal mention (“first-listed”) or any mention (“all-listed”) of specific diagnoses for chronic diseases resulting from alcohol abuse. Also included are data on the average length of hospital stay for alcohol-related discharge episodes. Data are presented by age and sex. Race-specific data are not reported because a large proportion of discharges do not include race information.

In this surveillance report, AEDS continues to assess the statistical significance of differences in the estimates. In doing so, AEDS uses variance estimation procedures recommended by NCHS to develop 95-percent confidence intervals for each estimate based on relative standard errors. Appendix A presents the technical aspects of statistical significance testing and describes the procedures used in this report. Appendix B presents tables on alcohol-related diagnoses.

### **Sources and Limitations of Data**

Hospital discharge data in this report are obtained from the NHDS, which has been conducted by NCHS since 1965. These data are processed by NCHS and made available on public use computer files. This report begins with 1979, the year in which the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) was implemented. ICD-9-CM is a diagnostic coding scheme published by the Commission on Professional and Hospital Activities (1978) and is based on the World Health Organization’s ninth revision of the ICD (1977).

The NHDS collects data from a sample of non-Federal, short-stay hospitals with six or more beds and an average length of stay of fewer than 30 days. The sample is stratified by geographic region and hospital size. The probability of selecting a hospital is directly

proportional to its size. Discharge episodes are sampled randomly at each participating hospital; the episode sampling ratio within an individual hospital varies inversely with the probability of hospital selection. NCHS calculates appropriate weights and includes them in the data files to project national estimates from the sample. Descriptions of the NHDS sampling design, data collection procedures, and data collection instruments used during the 1979–87 period are published elsewhere by NCHS (1977, 1990).

In 1988 NCHS implemented a new sample design to (1) provide geographic sampling comparability with other surveys conducted by NCHS, (2) update the sample of hospitals selected for the survey, and (3) maximize the use of data collected through automated systems. This change in the sample design may affect trend data because some differences between NHDS statistics based on the earlier sample (1979–87) and statistics based on the 1988 sample may be due to sampling variability rather than changes in patterns of hospital utilization (NCHS 1990). For example, NCHS compared the old survey results with the new results and produced significantly lower estimates of first-listed and all-listed diagnoses of alcohol dependence in the new series (Haupt and Kozak 1992).

For each hospital discharge episode in the sample, the following items are provided: the patient’s age, sex, race, marital status, and length of stay; the hospital’s size and regional location; and codes for up to seven diagnoses and up to four surgical procedures.

Estimates of alcohol-related morbidity based on the NHDS sample may underestimate the overall prevalence of such morbidity in the general U.S. population. For example, the NHDS sample does not include Veterans’ Administration and other Federal hospitals or hospitals with an average length of stay of 30 days or longer. Morbidity among individuals who are not hospitalized (i.e., those who seek outpatient treatment or no treatment) also is not reflected in the NHDS data. Furthermore, the stigma associated with alcohol abuse may lead to some reluctance by

health professionals to report an alcohol-related diagnosis.

To properly interpret the data, the following characteristics of the NHDS should be understood:

- The NHDS provides a record for each sampled hospital discharge episode, not for each individual patient; therefore, an unknown portion of discharge episodes may reflect multiple hospital episodes for a single patient in a given year. Because no patient identifiers appear in the NHDS public use data files, it is not possible to identify records for different hospital episodes involving the same patients. Therefore, the numbers and rates reported here reflect the prevalence of alcohol-related hospital discharge episodes and not the prevalence of alcohol-related diagnoses among individual patients.
- Because NHDS data are obtained from a sample of hospital discharge episodes, any resulting estimates are subject to sampling error. The reliability of estimates is a function of sample size. NCHS guidelines, based on the NHDS sampling plan, require a minimum of 30 unweighted cases for even marginally acceptable reliability. In this report, data based on fewer than 30 NHDS records (population estimates in the range of 5,000 to 6,000 after weights are applied) are not displayed for table cells. Estimates below 10,000 may be only marginally reliable.
- The NHDS methodology allows for coding up to seven different diagnoses for each hospital discharge record. The first of these code positions (the first-listed diagnosis) contains a code for the principal diagnosis. The remaining six positions can be used to code additional diagnoses identified during the patient's hospital stay. In this report, an all-listed diagnosis is a diagnosis that appears in any one of the seven possible code positions for each record, and counts of all-listed diagnoses are described as counts for any mention of the particular diagnosis. The first-listed diagnosis need not be the most serious diagnosis recorded on a discharge record, nor is it necessarily the diagnosis that accounts for the overall length of a patient's hospital stay. In

addition, it is not clear to what extent the introduction in 1982 of diagnosis-related groups (DRGs) as a basis for payment of health care costs may influence the assignment of a principal diagnosis.

- Numbers and rates based only on first-listed diagnoses can be misleading because these data overlook other morbidity that may be diagnosed during the patient's hospitalization. In this report, numbers and rates are presented for first-listed and all-listed mentions of alcohol-related diagnoses. Therefore, first-listed diagnoses constitute a subset of all-listed diagnoses. All-listed diagnostic categories are not mutually exclusive; a given discharge may appear in more than one all-listed diagnostic category. However, in this report, a hospital discharge with multiple diagnoses in the same category is not counted more than once. For example, one diagnostic category used in this report is alcoholic psychoses (ICD-9-CM code 291). Under this category are eight subclassifications. A discharge with diagnoses of both alcohol withdrawal delirium (code 291.0) and alcohol withdrawal hallucinosis (code 291.3) would be counted only once under the overall alcoholic psychoses classification even though more than one type of alcoholic psychosis appears on the record. (This method of counting all-listed diagnoses differs from the method used in NCHS publications; NCHS counts the number of mentions of specific diseases in hospital records, whereas AEDS counts the number of hospital records that mention specific diseases.)
- Two data collection procedures have been used since 1985 in conducting the survey: (1) a manual system of sample selection and data abstraction and (2) an automated method that involves the purchase of data files from abstracting service organizations. An increasing proportion of respondent hospitals have employed the automated method. Prior to 1985, all data were collected manually. In 1987 approximately one-sixth (17 percent) of sample hospitals used the automated method; by 1997 40 percent of these hospitals were using the automated method (Lawrence and Hall

1999). Because hospitals using the automated method are unlikely to report race, data collection procedures have a systematic effect on the availability of race-specific data (Kozak 1995). Further investigation is necessary to determine the influence of variability in data collection procedures on morbidity trends.

- The change in sample design implemented in 1988 implies a discontinuity in time-series data. Therefore, interpretations of trends in the most recent 10 years of the study should be regarded as tentative and subject to refinement, with the future availability of a longer time-series based on the new sample design.
- Fifteen is the youngest age included in this report, rather than 14, which was used in some other AEDS reports. This age cutoff was used because population denominators for calculating rates are more readily available in 5-year age groups, and exclusion of data on the 14-year-old group has little effect on alcohol-related morbidity rates.

In describing findings, the word “significant” pertains to statistical significance. On the charts that plot error bars around estimates (figures 5 through 9), two estimates are significantly different when their respective error bars do not overlap vertically. Each error bar represents the 95-percent confidence interval around the estimate. There is no implication that a significant difference is necessarily a major or substantive difference. Therefore, interpretations of significant differences in this report are conservative (in view of several considerations discussed in Appendix A). Readers examining figures displaying confidence intervals should exercise caution in interpreting findings.

From 1979 through 1987, population data used in calculating hospital discharge rates were intercensal estimates published by the U.S. Census Bureau (1982, 1990). After 1987, annual population data on the civilian resident population consist of intercensal estimates from the Census Bureau, which are disseminated by NCHS as part of the data set documentation. The 1990 rates are calculated using census-based denominators made

available through NCHS. The 1997 population counts provided by NCHS were adjusted for the undercount of the 1990 census; however, to maintain consistency with years 1990–1996, unadjusted counts for 1997 were chosen for use in this report.

## Definitions and Exclusions

A major methodological issue of this report is the specification of the categories of alcohol-related diagnoses. The level of diagnostic detail defined in the ICD-9-CM and available in the NHDS is so great that the most detailed classification of morbidity results in diagnostic categories with very few observations. To minimize the problem of small cell sizes, detailed diagnostic classifications from the NHDS are reported under four major alcohol-related categories, with three subcategories for chronic liver disease and cirrhosis. These categories (and the associated specific alcohol-related diagnoses) are listed in the table of definitions on the following page. The categories are consistent with the diagnostic categories used in previous AEDS publications on alcohol-related morbidity (Caces, Stinson, and Dufour 1997; Caces, Stinson, and Dufour 1996; Caces, Stinson, and Dufour 1995; Caces, Stinson, and Dufour 1994; Caces and Dufour 1993; Caces, Stinson, and Noble 1992; Caces et al. 1991; Stinson 1989; Stinson and Williams 1987).

For chronic liver disease and cirrhosis, the ICD-9-CM allows for a distinction between diagnoses with and without mention of alcohol. In recent years AEDS has chosen not to emphasize this distinction and has reported all liver cirrhosis in analyses of alcohol-related morbidity and mortality. This practice was adopted at the recommendation of health professionals and epidemiologists who attended a conference sponsored by AEDS in 1979. In keeping with this practice, this report includes an overall category of chronic liver disease and cirrhosis that does not distinguish between cirrhosis with and without mention of alcohol. For consistency with causes of death reported in other AEDS publications on cirrhosis mortality (Saadatmand et al. 1998), this report also includes three subcategories of

### Definition of Alcohol-Related Diagnoses

Category Used in Report	Classification in ICD-9-CM
Alcoholic psychoses	291.0 Alcohol withdrawal delirium 291.1 Alcohol amnestic syndrome 291.2 Other alcoholic dementia 291.3 Alcohol withdrawal hallucinosis 291.4 Idiosyncratic alcohol intoxication 291.5 Alcoholic jealousy 291.8 Other specified alcoholic psychosis 291.9 Unspecified alcoholic psychosis
Alcohol dependence syndrome	303.0 Acute alcoholic intoxication 303.9 Other and unspecified alcohol dependence 265.2 Pellagra 357.5 Alcoholic polyneuropathy 425.5 Alcoholic cardiomyopathy 535.3 Alcoholic gastritis
Nondependent abuse of alcohol	305.0 Alcohol abuse
Chronic liver disease and cirrhosis:	
Alcoholic cirrhosis of the liver	571.0 Alcoholic fatty liver 571.1 Acute alcoholic hepatitis 571.2 Alcoholic cirrhosis of liver 571.3 Alcoholic liver damage, unspecified
Other specified cirrhosis of the liver without mention of alcohol	571.4 Chronic hepatitis 571.6 Biliary cirrhosis 571.8 Other chronic nonalcoholic liver disease 572.3 Portal hypertension
Unspecified cirrhosis of the liver without mention of alcohol	571.5 Cirrhosis of liver without mention of alcohol 571.9 Unspecified chronic liver disease without mention of alcohol

cirrhosis: (1) alcoholic cirrhosis of the liver, (2) other specified cirrhosis of the liver without mention of alcohol, and (3) unspecified cirrhosis of the liver without mention of alcohol.

This report presents data for the U.S. population ages 15 and older in the following age categories: 15 to 24, 25 to 44, 45 to 64,

and 65 and older. Age 15 is below the minimum legal drinking age in all 50 States and the District of Columbia, but survey results show that a large number of adolescents drink alcoholic beverages. For example, data from the 1992 National Longitudinal Alcohol Epidemiologic Survey indicate that 13.4 percent of current drinkers age 18 and older in the United States began drinking at

age 15 or younger (Alcohol Epidemiologic Data System 1997).

In assessing alcohol-related diagnoses, some conditions are excluded. For example, in a typical year, approximately 12 to 13 percent of all hospital discharges are for conditions related to pregnancy and delivery. In 1997 these conditions accounted for 12.3 percent of all discharges (Lawrence and Hall 1999). Because pregnancy is not an illness, conditions related to pregnancy and childbirth were excluded in assessing alcohol-related morbidity. To examine the percentage of all discharges associated with a first-listed or an all-listed alcohol-related diagnosis, the percentages were calculated after excluding from the denominator all records with any diagnosis indicating a supplementary ICD-9-CM classification for females delivering babies (code V27). In general, excluding conditions related to pregnancy and delivery yields higher percentages of alcohol-related diagnoses, but the relative patterns across time remain the same.

In contrast to the last several annual reports in this series, this report updates morbidity data for two years (1996 and 1997) rather than for one year. Because there have been few abrupt changes in the general trends of alcohol morbidity, this report emphasizes findings for the most recent year, 1997.

## FINDINGS

Findings are presented in the following three major sections: (1) numbers of alcohol-related hospital discharges for first-listed and all-listed diagnoses, (2) trends in rates of alcohol-related hospital discharges, and (3) trends in average length of stay for specific alcohol-related diagnoses based on first-listed diagnoses. The tables in Appendix B present detailed data on numbers, rates, and average length of hospital stay.

Estimates of alcohol-related morbidity rates based on the new sample design implemented since 1988 are significantly lower overall than earlier estimates. Because of this general pattern, estimates based on the new sample

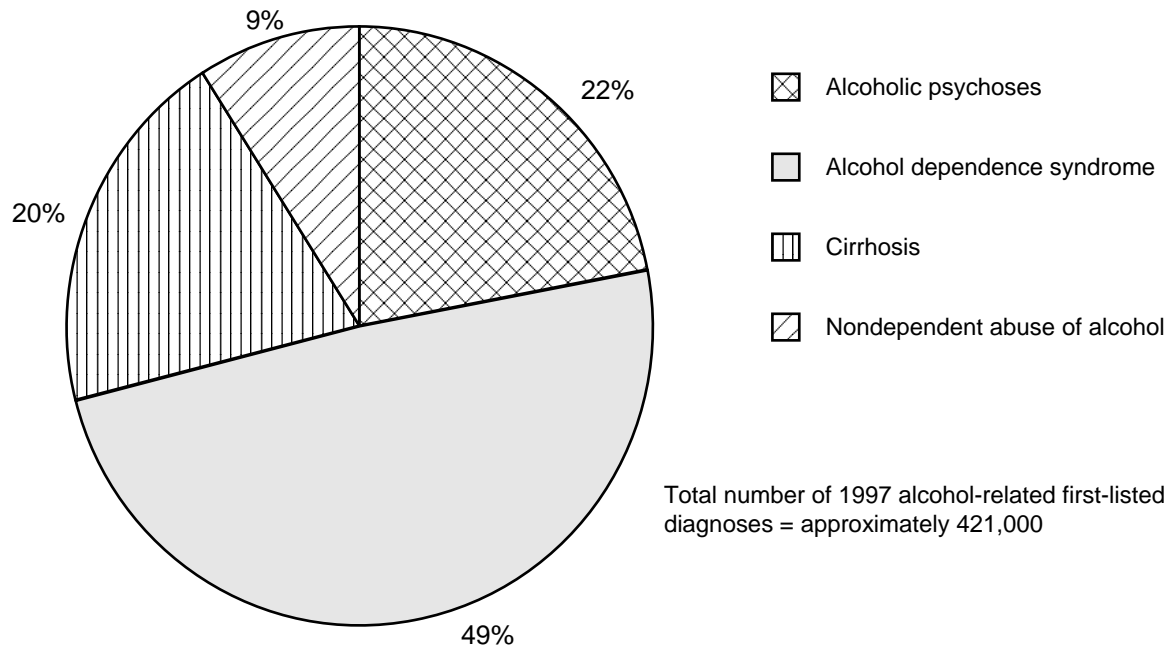
design that show declines may not be remarkable, whereas increases in rates since 1988 are likely to be noteworthy. However, as stated earlier, it is essential to exercise caution in interpreting changes in trends based on the past 10 years alone. The following section, therefore, describes trends based on the initial 9-year period, as well as trends based on the entire 19-year period.

### Numbers of Alcohol-Related Hospital Discharges

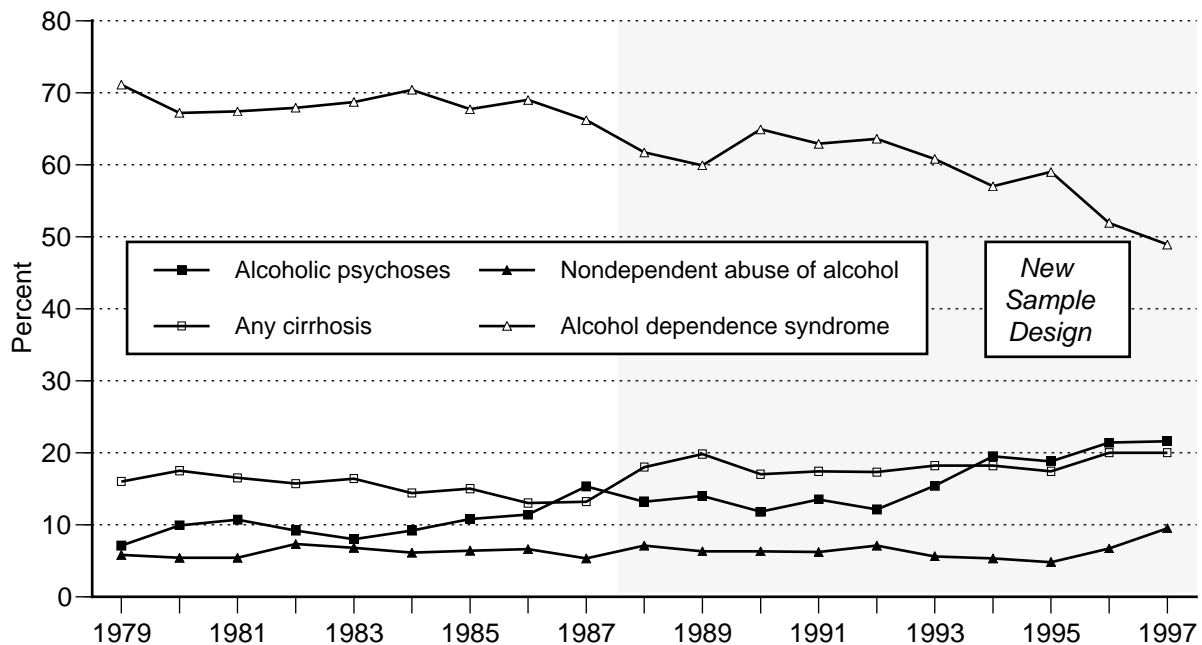
In 1997 NHDS estimated approximately 28.6 million discharge episodes for persons ages 15 and older from short-stay hospitals. Of these episodes, approximately 421,000 (1.5 percent) had a first-listed alcohol-related diagnosis, and approximately 1.3 million (4.7 percent) had an all-listed alcohol-related diagnosis. The distribution of first-listed alcohol-related diagnoses for 1997 is shown in figure 1. The majority (49 percent) of first-listed diagnoses were for alcohol dependence syndrome, followed in order by alcoholic psychoses (22 percent), cirrhosis of the liver (20 percent), and nondependent abuse of alcohol (9 percent). The relative ranks of first-listed alcohol-related diagnoses have remained fairly constant over the 19-year period, with the exception of 1987 and the last 4 years (1994–1997), when first-listed diagnoses for alcoholic psychoses exceeded those for cirrhosis (see figure 2). Given the closeness of the trends for these 2 diagnoses, it remains to be seen if diagnoses of alcoholic psychoses will continue to exceed diagnoses of cirrhosis in the future.

Figure 3 shows the distribution of first-listed diagnoses—whether alcohol-related or non-alcohol-related—among discharges that had an alcohol-related diagnosis in any of the seven possible diagnostic fields. This figure demonstrates that examining first-listed diagnoses alone can result in a substantial underestimate of the actual prevalence of alcohol-related morbidity in the NHDS sample. For example, over two-thirds (69 percent) of alcohol-related morbidity episodes in 1997 did not appear as a first-listed diagnosis. These “hidden” alcohol-related

**Figure 1.** Percent distribution of first-listed diagnoses among discharges with first-listed mention of an alcohol-related diagnosis, 1997.

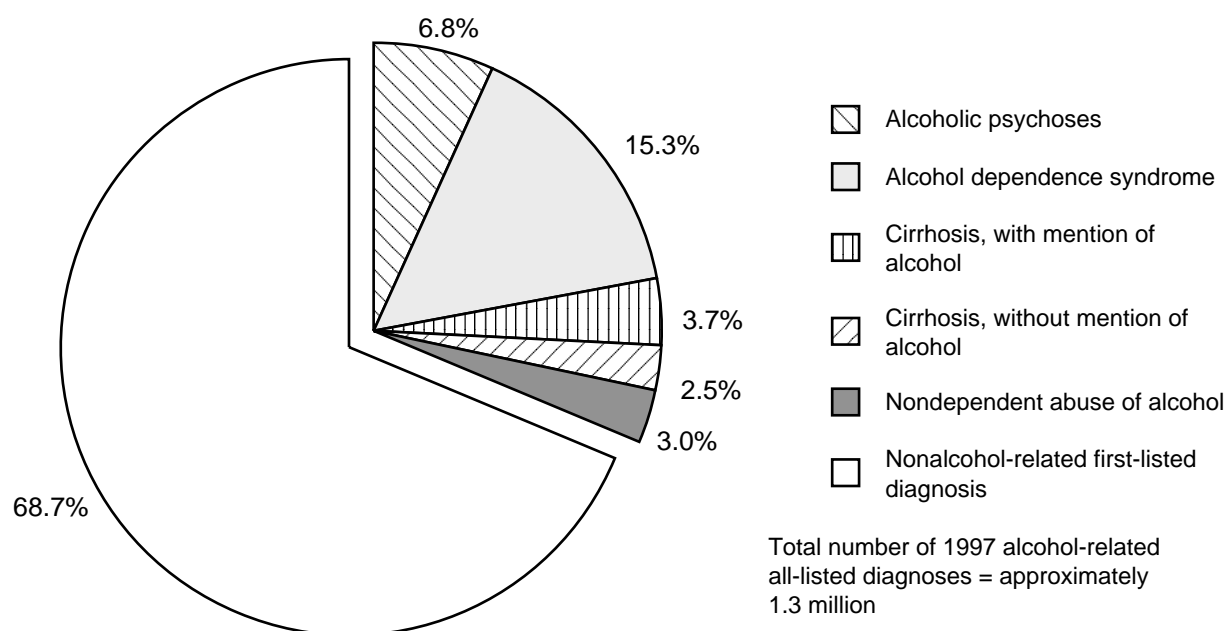


**Figure 2.** Trends in percent distribution of principal (first-listed) diagnoses among discharges with first-listed mention of an alcohol-related diagnosis, 1979–97.





**Figure 3.** Percent distribution of principal (first-listed) diagnoses among discharges with any (all-listed) mention of an alcohol-related diagnosis, 1997.



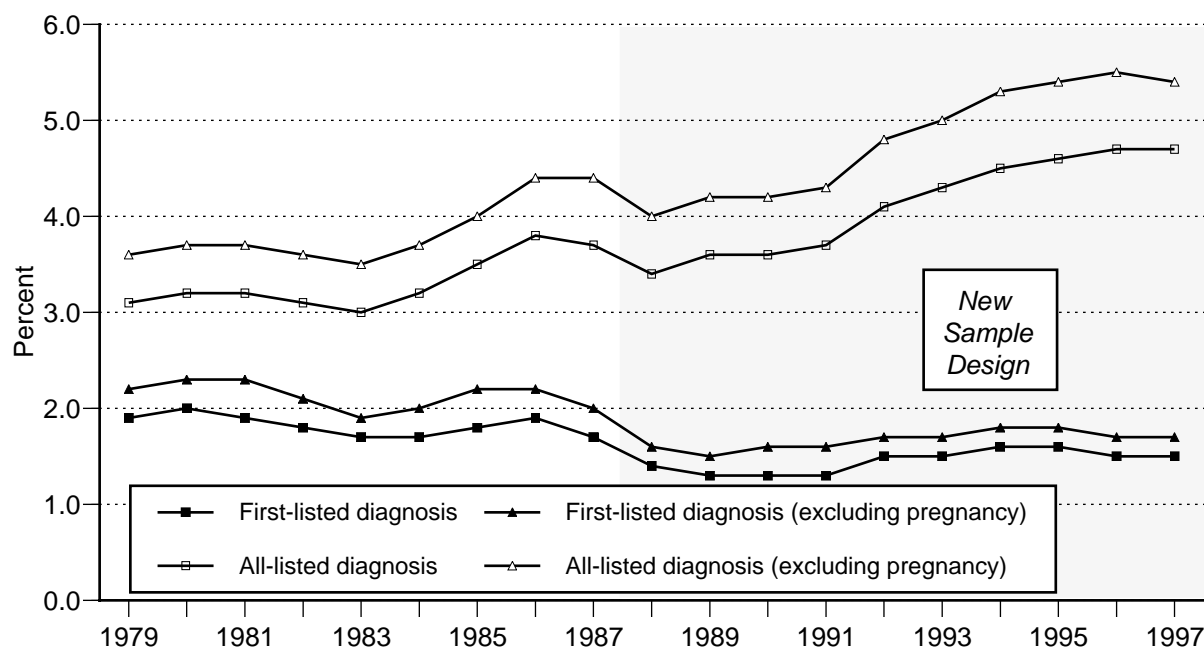
diagnoses are represented in the unshaded left-hand portion of figure 3.

Figure 4 presents trends in the percentages of first-listed and all-listed alcohol-related diagnoses from 1979 through 1997. In each of these years, there was a notable difference between first-listed and all-listed percentages, indicating that substantial alcohol-related morbidity was reported among patients hospitalized for other reasons. The data in figure 4 suggest that while there has been relatively little change in the percentage of hospital discharges involving patients with first-listed mention of an alcohol-related diagnosis, the proportion of hospital discharges with any mention of an alcohol-related diagnosis has increased. The fraction of alcohol-related diagnoses that were not first-listed has grown over time. In effect, hidden alcohol-related morbidity has grown steadily from 39 percent in 1979 to 69 percent in 1997. Over the 19-year observation period, less than one-half (43 percent) of alcohol-related diagnoses were first-listed.

Although proportions are slightly lower in the period covered by the new sample,<sup>1</sup> little change is apparent in the proportion of first-listed alcohol-related diagnoses. Beginning in 1984, however, the data for all-listed alcohol-related diagnoses suggest an increase in the percentage of patients with all-listed alcohol-related morbidity, some of which may have been diagnosed only after hospitalization for other reasons. It cannot be determined from these data whether this increase is due to more alcohol-related morbidity among hospital patients or to a greater awareness among physicians of alcohol-related morbidity, leading to the recording of more such diagnoses in medical records. Figure 4 also presents percentages calculated with and without pregnancy-related diagnoses. As indicated earlier, excluding discharges with pregnancy-related conditions yields higher percentages of first-listed and all-listed

<sup>1</sup> As mentioned earlier, trend data may be affected by the change in sample design, and sampling error cannot be ruled out.

**Figure 4.** Trends in percent of discharges with principal (first-listed) or any (all-listed) mention of an alcohol-related diagnosis among all discharges, 1979–97.



alcohol-related diagnoses, but the relative trends over time remain the same.

Trends in alcohol-related morbidity are best addressed by examining population-based rates—the number of hospital discharges as a proportion of the overall population at risk. In this report, rates are expressed as the number of hospital discharge episodes for every 10,000 persons in the population. Although the absolute number of alcohol-related hospital discharges will vary as a function of population size, the number of alcohol-related hospital discharges may be useful for planning and allocating resources. Tables 1 and 2 in Appendix B provide additional information on trends in both rates and numbers of these discharges.

### **Trends in Rates of Alcohol-Related Hospital Discharges**

This section provides trends in the rates of hospital discharges for combined alcohol-related diagnoses and for specific alcohol-related diagnoses.

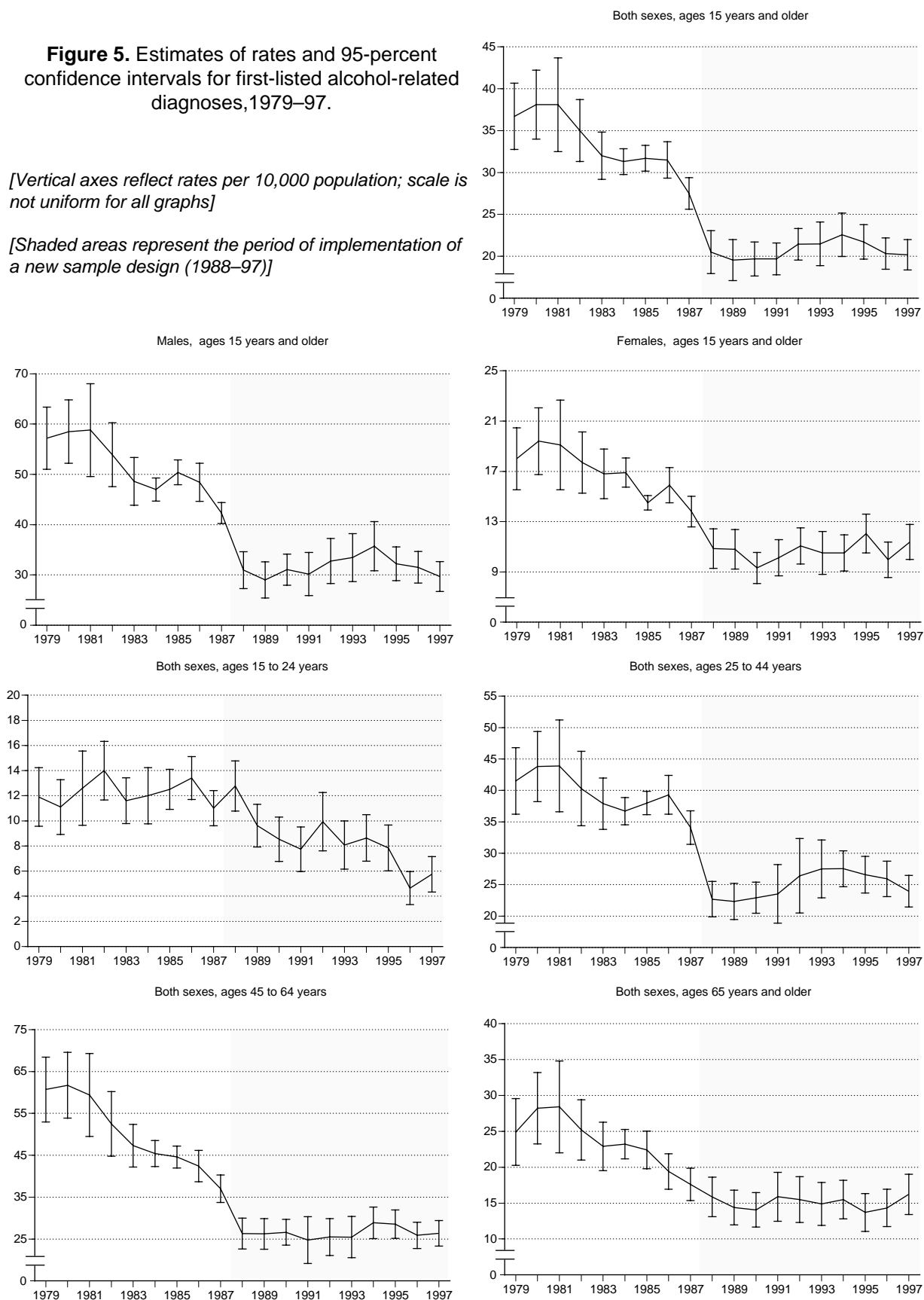
### *Combined Alcohol-Related Diagnoses*

Figure 5 presents rates and confidence intervals for combined first-listed alcohol-related diagnoses by sex and by age. Figure 6 shows similar information for all-listed alcohol-related diagnoses. Tables 1 and 2 in Appendix B present estimated numbers as well as rates. Figure 5 indicates that for both sexes ages 15 and older, alcohol-related discharge rates significantly decreased over the initial 9-year period, and rates remained fairly constant in the most recent 10-year period. Although the change in sample design must be considered when interpreting these findings, a stable trend of approximately 20 discharges per 10,000 was generally discernible in the new sample period that showed a slight increase peaking in 1994 (22.6 per 10,000 population) but has since returned to 20.2 discharges per 10,000 population as of 1997. The highest rate (38.1 discharges per 10,000 population) was observed in 1980 and 1981, and the lowest rate (19.5 discharges per 10,000 population) was observed in 1989, which represents a decline to about one-half

**Figure 5.** Estimates of rates and 95-percent confidence intervals for first-listed alcohol-related diagnoses, 1979–97.

[Vertical axes reflect rates per 10,000 population; scale is not uniform for all graphs]

[Shaded areas represent the period of implementation of a new sample design (1988–97)]



(49 percent) the peak rate. Part of this large decline may be due to sampling variability; therefore, a comparison within the first 9 years of observation is necessary. In 1987 the observed rate (27.5 discharges per 10,000 population) represented a significant decrease (28 percent) from the 1981 level. During the new sample period, no significant change in first-listed alcohol-related diagnoses has been observed, with the 1997 rate of 20.2 alcohol-related discharges per 10,000 population essentially unchanged since 1989 (19.5 discharges per 10,000 population). Similar early rate decreases can be seen for males and females considered separately, but the decrease appeared to be more marked for males than for females. A declining trend observed among males in the old sample period has shown no significant change during the new sample period. Among females, overall first-listed alcohol-related morbidity rates also remained somewhat stable in the 10-year new sample period (ranging from 9.3 to 12.1 discharges per 10,000 population) and are significantly lower than in the previous 9-year sample period. Across all years, rates for males were substantially higher than rates for females. Rates for males in a typical year were three times as high as rates for females.

An examination of trends in first-listed alcohol-related morbidity by age group suggests that overall decreases during this 19-year period resulted from steady, although somewhat precipitous, decreases during the earlier time period in the rates for the 2 oldest age groups. There was no apparent change in the rates for the youngest age group 15 to 24) from 1979 to 1987. There does, however, appear to be a significant 55 percent decline in the more recent time period (from 12.8 per 10,000 population in 1988 to 5.8 in 1997) for this age group. Among those ages 25 to 44, rates did not significantly change, except when the new sample design was implemented. In contrast, rates for the two older age groups declined significantly during the initial 9-year period and stabilized in the most recent 10 years. Rates for persons ages 45 to 64 decreased 40 percent, from a high of

61.7 discharges per 10,000 population in 1980 to 37.0 in 1987, and remained stable between 24.7 and 28.9 per 10,000 population in the 10-year new sample period. For persons ages 65 and older, rates decreased by 38 percent from a high of 28.4 per 10,000 population in 1981 to 17.6 in 1987. In the new sample period, rates remained basically unchanged from 1988 (ranging between 13.7 and 16.2 discharges per 10,000 population).

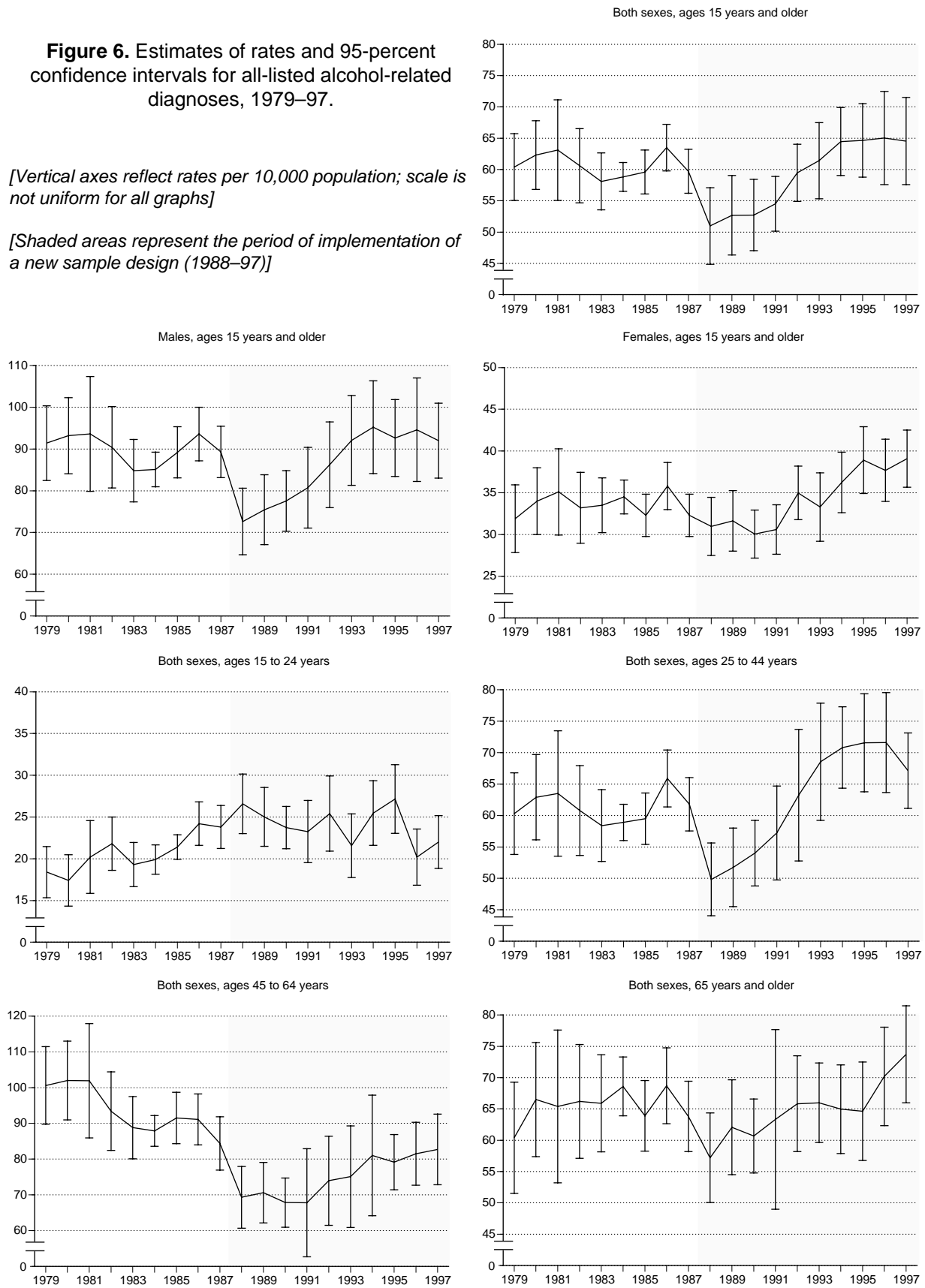
A comparison of rates over time among the four age groups displayed in figure 5 reveals that persons in the youngest age group (15 to 24) consistently had the lowest alcohol-related morbidity, followed by those in the oldest age group (65 and older). Alcohol-related morbidity rates among those in the middle age categories were substantially higher, with the 45 to 64 age group having rates approximately twice as high as the oldest age group and three times as high as the youngest age group.

Figure 6 shows comparable rates and confidence intervals for all-listed combined alcohol-related diagnoses by sex and by age group. The patterns over time in this figure are very different from the patterns in figure 5. For any mention of an alcohol-related diagnosis (all-listed) among those ages 15 and older, a significant change from 1979 to 1994 was observed, which appears to have stabilized through 1997, in addition to the lower rates associated with a change in the sample implemented in 1988. During the new sample period (1988–97), a clear increasing trend was observed. Compared with the 1988 rate of 51.0 per 10,000 population, the 1997 rate of 64.5 is significantly higher (27 percent). The pattern among males also was significant, showing a 27-percent rate increase in the new sample period from 72.6 discharges per 10,000 population in 1988 to 92.0 in 1997. Among females, the first significant increase in all-listed alcohol-related discharge rates was observed in 1995 (38.9 per 10,000), a 30-percent increase from 1990 (30.0 per 10,000). The trend continued to increase to 39.1 per 10,000 population in 1997. As with results based on first-listed rates, all-listed rates for females were consistently much

**Figure 6.** Estimates of rates and 95-percent confidence intervals for all-listed alcohol-related diagnoses, 1979–97.

*[Vertical axes reflect rates per 10,000 population; scale is not uniform for all graphs]*

*[Shaded areas represent the period of implementation of a new sample design (1988–97)]*



lower, by at least half, when compared with those for males.

While there was a significant increase over time in the rates of discharge with all-listed alcohol-related diagnoses for patients ages 15 to 24 (a 56-percent increase from a 1980 low of 17.4 discharges per 10,000 population to the highest recorded rate of 27.1 in 1995), this trend appears to have declined in the last 2 years, returning to a rate of 22.0 per 10,000 by 1997. This is consistent with the recent decline seen for first-listed diagnoses among this age group. For the 25 to 44 age group, a significant increasing trend over the past 10 years is observed that is not evident in the older age groups. In the 25 to 44 age group, the rate of any mention of alcohol-related diagnoses continued to grow steadily from 49.8 per 10,000 in 1988 to 71.6 in 1995, a 44-percent increase. Only in the last year, 1997, has there been a decrease (67.1 per 10,000); however, the rate for 1997 remains significantly higher than that for 1990.

Despite a slight increase in all-listed diagnoses for the 45 to 64 age group, the trend is not significant. However, there does appear to be a significant increase in all-listed diagnoses for the 65 and older age group within the 10-year new sample time period (a 29-percent increase from 57.2 per 10,000 population in 1988 to 73.7 per 10,000 in 1997) that was not observed for first-listed diagnoses. The implication of this finding is that, although older persons may enter the hospital for a variety of reasons that may not be immediately identifiable as alcohol-related morbidity, by the time they are discharged, a considerable number of patients in this group reveal alcohol-related morbidity. This suggests that alcohol-related morbidity among the oldest age group may be more serious than previously recognized.

The data previously reviewed on rates for first-listed alcohol-related diagnoses suggest that alcohol-related morbidity among the oldest age group (65 and older) was lower than for either of the two middle age groups (25 to 44 and 45 to 64). Examination of the rates for all-listed alcohol-related diagnoses indicates

that the lowest rates occurred in the youngest age group (15 to 24), and the highest rates occurred in the 45 to 64 age group. However, a different picture of alcohol-related morbidity among the oldest group is shown in figure 6. Although still below the alcohol-related morbidity rates for the next oldest group (45 to 64), rates among the oldest age group (65 and older) were not substantially different in levels from those in the 25 to 44 age group, with both age groups generally increasing in recent years.

Alcohol-related morbidity that is concealed when only first-listed diagnoses are considered is detected with data based on all-listed diagnoses. In general, for each age group, alcohol-related morbidity rates were approximately three times as high for all-listed diagnoses compared with first-listed diagnoses, except among those ages 15 to 24. For this youngest age group, the ratio of all-listed to first-listed diagnoses is between two to one and three to one. In the oldest age group, however, alcohol-related morbidity rates based on all-listed diagnoses can be three to four times as high as rates based on first-listed diagnoses. In 1995 only about one in five alcohol-related discharge episodes among the oldest age group was first-listed. Although rates for alcohol-related morbidity based on first-listed diagnoses reflect an underestimation of the actual magnitude of alcohol-related morbidity in general, such underestimation is substantially higher among this oldest age group.

#### *Specific Alcohol-Related Diagnoses*

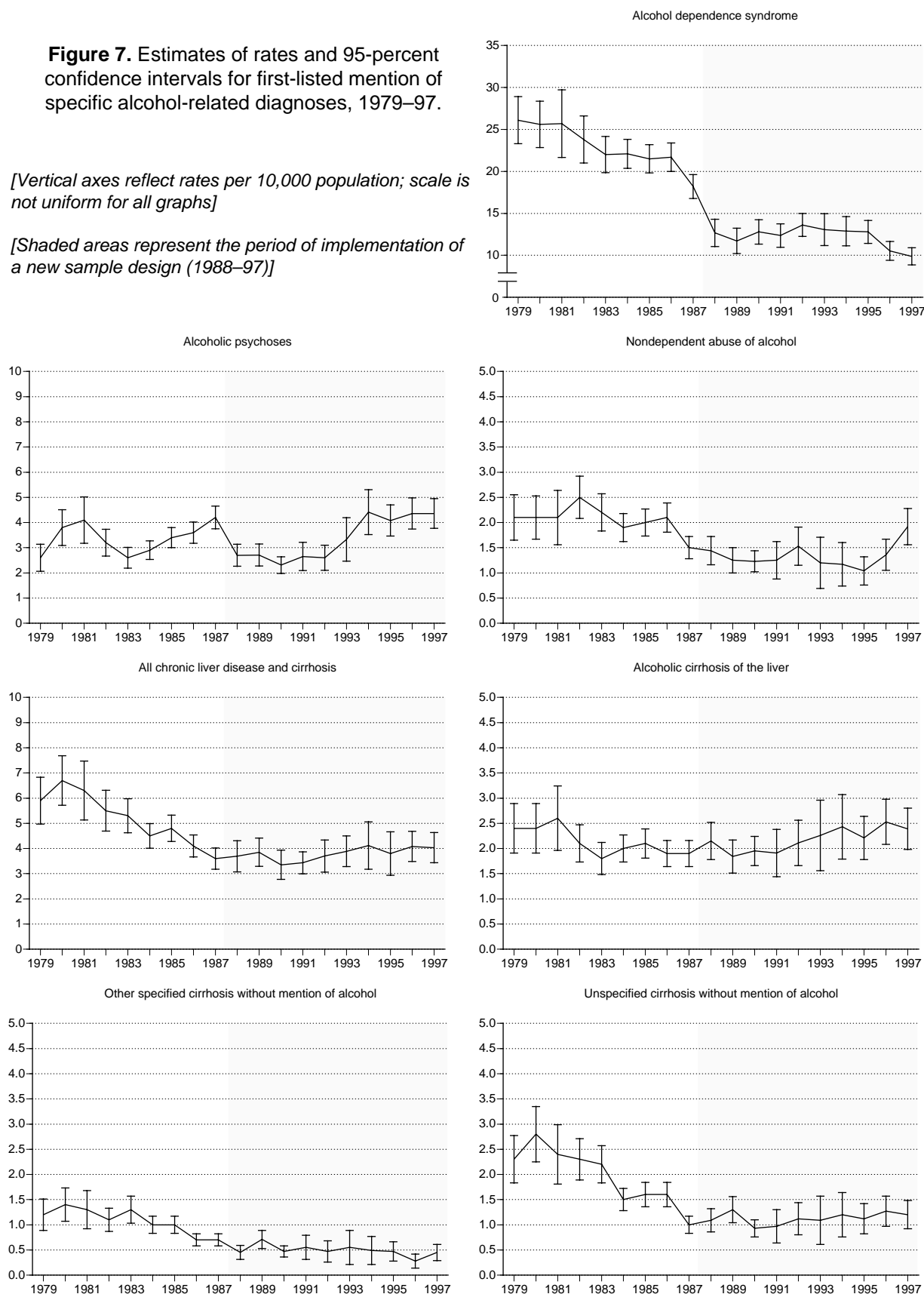
Figures 7 and 8 show trends in first-listed and all-listed discharges for specific alcohol-related diagnoses.

For alcohol dependence syndrome, there was a significant decrease in rates of discharges based on first-listed mention from 1979 to 1987 that appeared to stabilize in the period since the 1988 sample redesign. These rates decreased by 62 percent, from a high of 26.1 per 10,000 population in 1979 to a low of 9.9 in 1997. When the trend is examined for only 1979 to 1987, disregarding the period of

**Figure 7.** Estimates of rates and 95-percent confidence intervals for first-listed mention of specific alcohol-related diagnoses, 1979–97.

[Vertical axes reflect rates per 10,000 population; scale is not uniform for all graphs]

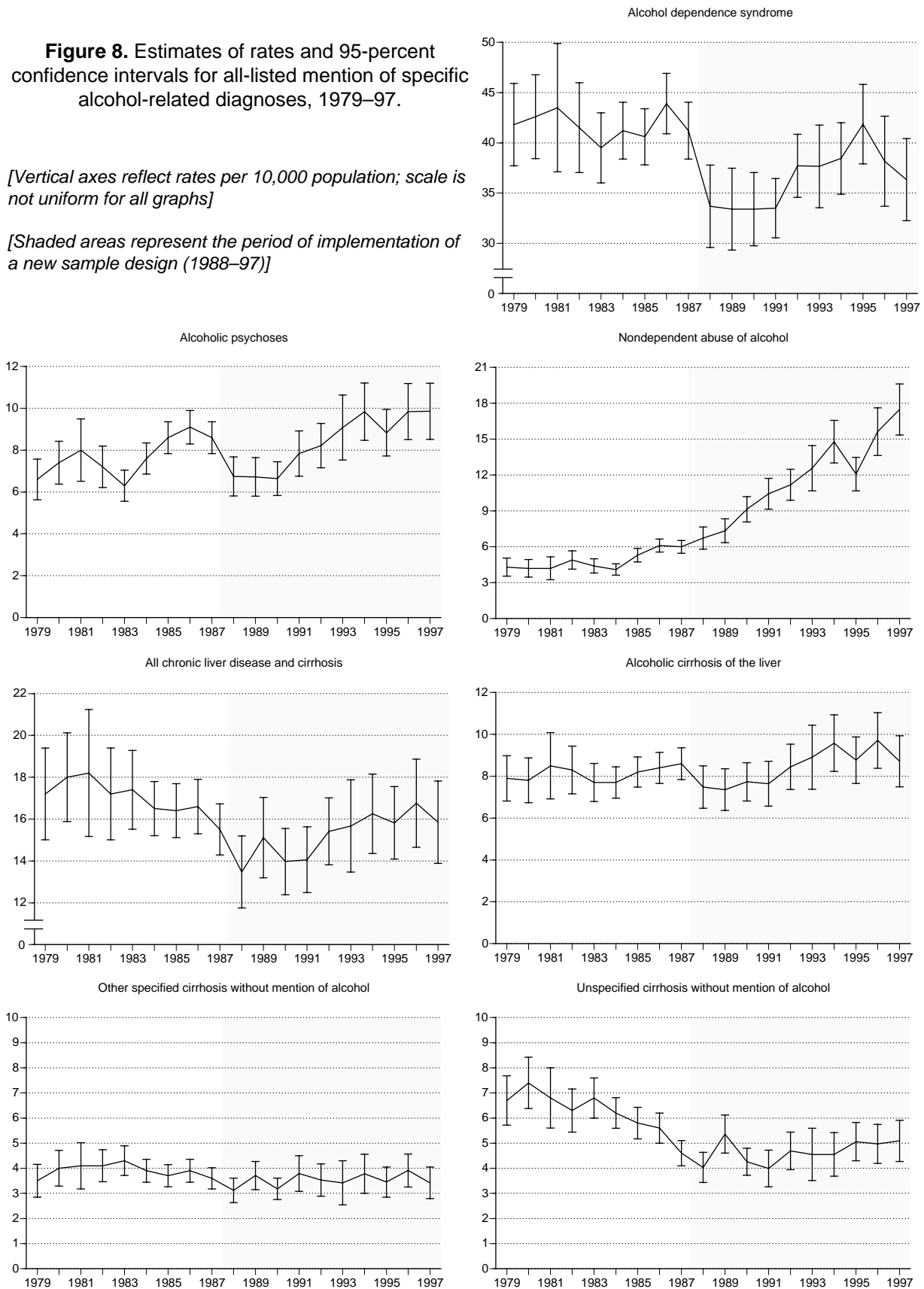
[Shaded areas represent the period of implementation of a new sample design (1988–97)]



**Figure 8.** Estimates of rates and 95-percent confidence intervals for all-listed mention of specific alcohol-related diagnoses, 1979–97.

[Vertical axes reflect rates per 10,000 population; scale is not uniform for all graphs]

[Shaded areas represent the period of implementation of a new sample design (1988–97)]





discontinuity in the sample, a significant 30-percent decline is observed. Thus, the general trend appears to be one of decline based on first-listed rates. However, in addition to the change introduced by the sample design, there was a significant increase in the rates based on any mention of alcohol dependence syndrome by 1995. Within the new sample period, the 1995 rate for any mention of alcohol dependence syndrome (41.9 per 10,000 population) is significantly higher than rates from 1988 to 1991. The all-listed rate of diagnosis has recently declined, however, to 36.6 per 10,000 population in 1997, which is not significantly different from the early years of the new sample period. Rates based on any mention of alcohol dependence syndrome often were more than double the rates based on principal mention, with an increasingly higher margin detected in recent years.

The general trend for alcoholic psychosis appears to be increasing since the beginning of the new sample period, with a leveling off in the last 4 years. For patients with first-listed mentions of alcoholic psychoses, meaningful trends in discharge rates occur in the new sample period, particularly the last 4 years (1994 to 1997), when rates are significantly elevated compared with rates for 1988 through 1992. Likewise, rates of any mention of alcoholic psychosis in the most recent 4 years are significantly higher compared with the first 3 years of the redesigned sample period. Consistent with the overall relationship between rates based on first-listed and all-listed mentions, substantially higher all-listed rates were observed.

In examining discharge episodes with a diagnosis of nondependent abuse of alcohol, a remarkable pattern was observed. Although rates for first-listed mention showed a tendency to decline and then slightly increase in the last 2 years over the period from 1979 to 1997, rates based on any mention of nondependent abuse of alcohol were significantly greater at the end of the 19-year period compared with the beginning. When the new sample period (1988–97) was excluded from comparisons, significantly greater rates

were observed in 1986 and 1987 compared with all previous years except 1982. Likewise for the new sample period, a consistent and statistically significant two-and-one-half times increase was observed in rates of nondependent abuse of alcohol based on any mention, from 6.7 per 10,000 population in 1988 to 17.5 in 1997, a 261-percent increase in 9 years.

Although general stabilization was apparent in discharge episodes for nondependent abuse of alcohol based on principal mention, there was no comparable stabilization in rates based on any mention. In fact, rates based on all-listed mentions have been increasing since 1985. In 1979 all-listed rates were twice as high as first-listed rates; by 1987 all-listed rates were four times as high as first-listed rates. This margin further increased over time; by 1997 rates for all-listed mentions were almost 9 times as high as those for first-listed mentions. These trends suggest that for nondependent abuse in particular, it is very misleading to rely solely on rates based on first-listed mention, where only 1 out of 9 diagnoses (11 percent) for this condition was first-listed in 1997. The magnitude and direction of trends changed significantly with the use of rates based on all-listed data.

Among patients with first-listed mention of all chronic liver disease and cirrhosis, discharge rates decreased significantly by 46 percent, from a high of 6.7 per 10,000 population in 1980 to a low of 3.6 in 1987. The apparent decline stabilized in the most recent period (1988–97) at 4.0 per 10,000 population in 1997. Morbidity rates based on any mention of all chronic liver disease and cirrhosis did not show a significant change over time. Only about one in four discharges with any cirrhosis diagnosis were first-listed in 1997.

Trends for subclassifications of chronic liver disease and cirrhosis were not always consistent with those for the combined cirrhosis category. For alcoholic cirrhosis, there was no significant change in rates for either first-listed mention or all-listed mention. For other specified cirrhosis of the liver without mention of alcohol, significantly lower

rates were observed based on first-listed mention since 1984 when compared with earlier years. Except for a fluctuation in 1989, lower rates for all-listed mention were observed in the last 10 years. For unspecified cirrhosis of the liver without mention of alcohol, no significant change was found based on first-listed or all-listed rates.

### **Trends in Average Length of Stay**

Table 3 in Appendix B presents detailed data on trends in average length of hospital stay, measured in days, for first-listed mention of specific alcohol-related diagnoses by sex and by age group. Data on average length of stay may be somewhat contaminated because of unknown comorbidity among patients hospitalized with alcohol-related diagnoses, and because other more serious conditions discovered after hospitalization may dictate the overall length of stay. Figure 9 shows trends in overall average length of stay for specific alcohol-related diagnoses. (See footnotes in table 3 for calculation details.)

There was a statistically significant decline occurring over time in average length of stay for first-listed mention of alcohol dependence syndrome. While relatively stable within the first time period, 1979–1988, the average length of stay declined significantly within the most recent time period from 10.7 days in 1988 to 6.3 days in 1997. There were no other statistically significant trend changes in average length of stay for first-listed mention of specific alcohol-related diagnoses over the 19-year time period. In 1997, discharges with a diagnosis of alcoholic psychoses averaged 5.7 days in the hospital. Cirrhosis discharges of any type averaged 7.2 days in the hospital. Of the cirrhosis subtypes, alcoholic cirrhosis discharges averaged 7.8 days, unspecified cirrhosis discharges averaged 7.3 days, and other specified cirrhosis discharges averaged 4.1 days, the least number of days in the hospital.

Discharges with a diagnosis of nondependent abuse of alcohol averaged 4.5 days. However, a substantially higher average stay for nondependent abuse of alcohol was observed in 1988. Although not

statistically significant, a possible explanation for this aberration is the change in sample design, specifically the introduction of new sample hospitals. Possible misclassification of alcohol dependence syndrome cases into this category is suggested by the notable number of discharges staying for 28 days or longer, indicating treatment for dependence and inflating the average for this year. A correction of this problem is suggested by the reversal in 1989, a drop maintained through 1997 at levels closer to those of previous years.

With the possible exception of alcohol dependence syndrome, trends in average length of stay have not changed significantly over time. These trends suggest no evident effect of any major breakthroughs in hospital treatment of alcohol-related conditions during the 19-year study period.

### **SUMMARY**

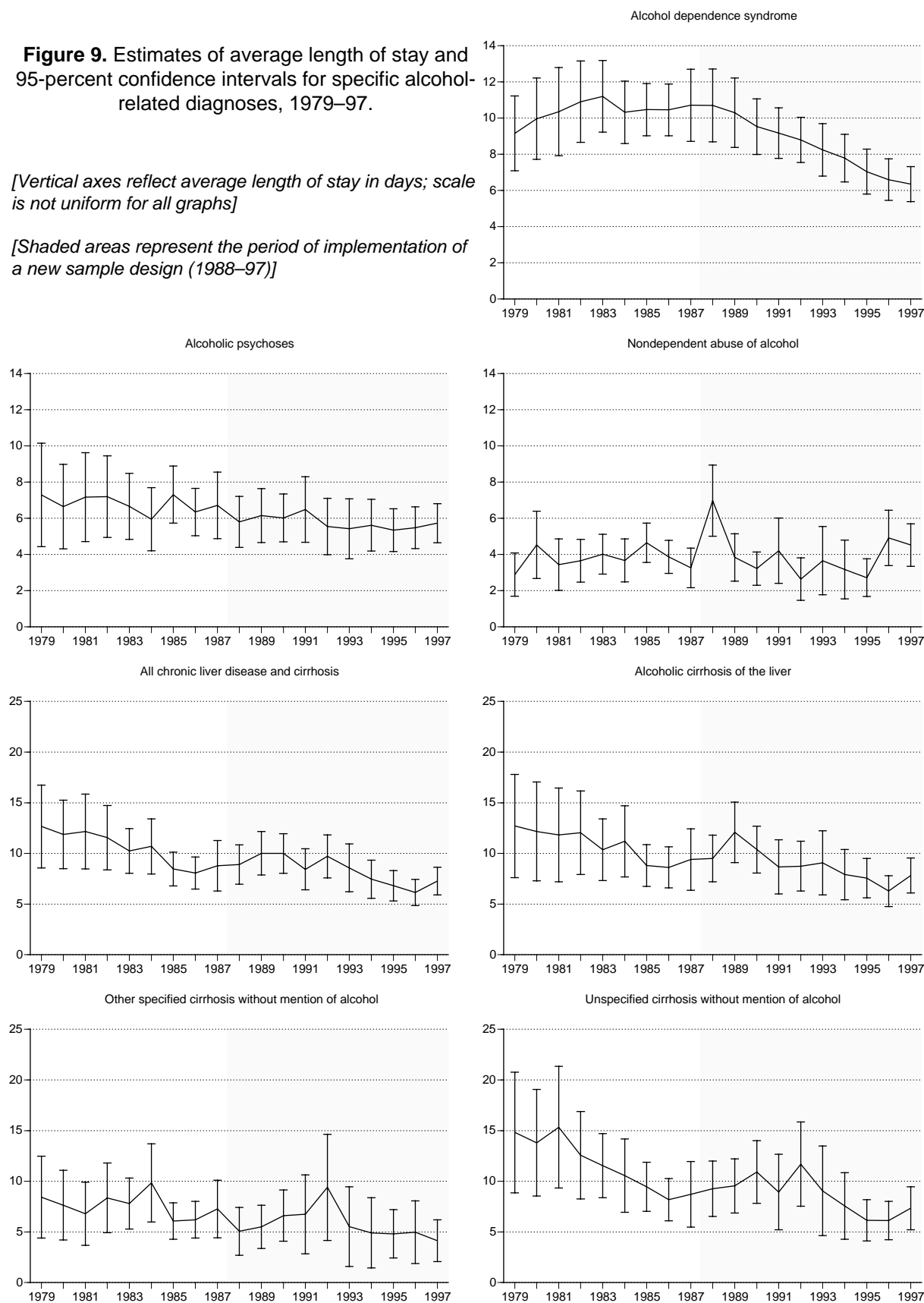
Data on alcohol-related morbidity diagnoses from short-stay hospital discharges were remarkably consistent over 19 years (1979–97); no dramatic trends were evident. The data show the following:

- Principal (or first-listed) alcohol-related diagnoses account for slightly less than one-third of all alcohol-related morbidity in 1997. This proportion has decreased steadily since 1979, when first-listed diagnoses accounted for 61 percent of all alcohol-related morbidity.
- The 1997 rankings of alcohol-related diagnoses—in decreasing order of prevalence—are alcohol dependence syndrome, alcoholic psychoses, cirrhosis (with and without mention of alcohol), and nondependent abuse of alcohol.
- For all alcohol-related diagnoses, except cirrhosis without mention of alcohol, discharge rates in 1997 are substantially higher for males than for females.
- Discharge rates for the youngest age group (15 to 24) appear unchanged early in the study period and show a recent decline when first-listed rates are examined. For middle and older age groups, a downward trend followed by stabilization is noted in

**Figure 9.** Estimates of average length of stay and 95-percent confidence intervals for specific alcohol-related diagnoses, 1979–97.

*[Vertical axes reflect average length of stay in days; scale is not uniform for all graphs]*

*[Shaded areas represent the period of implementation of a new sample design (1988–97)]*



first-listed discharge rates. Among all age groups, no declining trends are observed when rates for all-listed mentions of alcohol-related diagnoses are examined. In fact, for the 25 to 44 and 65 and up age groups, a significant increase is observed from 1988 to 1997.

- Based on first-listed discharge rates for alcohol dependence syndrome, a sustained downward trend was observed from 1979 to 1987 that has stabilized since 1988. Based on all-listed discharge rates, a significantly higher rate was observed in 1995 compared with rates 4 years earlier (1988 through 1991), a change that occurred within the period of the new sample design.
- For nondependent abuse of alcohol, all-listed discharge rates show a clear and significant upward trend from 1985 to 1997; this is contrary to the stabilized pattern observed based on first-listed discharge rates.
- Alcohol-related diagnoses in decreasing order of severity, as measured by average length of hospital stay in 1997, are cirrhosis, alcohol dependence syndrome, alcoholic psychoses, and nondependent abuse of alcohol. Only alcoholic dependence syndrome showed a significant decrease in average length of stay.

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## APPENDIX A

### Assessment of Statistical Significance

Because data on hospital discharges are based on a sample of all discharges, there is some sampling error in the estimates presented in this report. To assess the statistical significance of apparent differences in the estimates presented, we have used variance estimation procedures recommended by the National Center for Health Statistics (NCHS) to develop confidence intervals for each estimate. These variance estimates are themselves approximations due to the complex nature of the NCHS sampling plan.

The confidence intervals presented here are based on relative standard errors (RSEs), which are standard errors expressed as a percentage of the estimate. NCHS provides a method for obtaining RSEs in the technical documentation of the annual National Hospital Discharge Survey summary report. For the years 1979 to 1987, NCHS provided RSEs in chart form. For this report, we used annual RSE charts for all variables on estimates of first-listed and all-listed diagnoses and similar annual RSE charts for all variables on estimates of days of care. RSE values corresponding to estimates were taken from the chart for each item in each year. For the years after 1987, RSE values were derived from formulas provided by NCHS in the data tape documentation for first-listed and all-listed diagnoses and for length of stay. RSE values were multiplied by 1.96; this value was added to and subtracted from each estimate to obtain a 95-percent confidence interval.

This strategy for assessing statistical significance has two implications. First, it is a relatively conservative strategy for individual comparisons among independent samples; a more precise method for comparing the difference between any two specific values would involve combining the individual variances of each estimate, resulting in the determination of statistical significance for a

smaller difference than is required using the present method.

The second implication, however, is that this strategy can yield more liberal results. This is due to the fact that several comparisons are being considered within this one study (or experiment). Because we use a 95-percent confidence interval, this translates to a 5-percent chance of committing a Type I error (i.e., rejecting the null hypothesis of no difference when it is true), meaning that significance is incorrectly attributed to an observed difference. When several comparisons are made, each with a 5-percent chance of a Type I error, then the chance of making at least one Type I error in the set of comparisons increases beyond 5 percent. The probability of committing at least one Type I error in an experiment is referred to as the “experimentwise” error rate. The problem of experimentwise errors increases rapidly as the number of comparisons is increased. For example, 20 comparisons tested with 95-percent confidence yields an experimentwise error rate of 0.64.

Because of the caveats described above, the interpretations of apparently significant differences in the report are conservative. Readers examining the figures that display confidence intervals should exercise similar caution in assessing the reported findings.

## APPENDIX B

### List of Tables

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**Table 1.** Number and rate of first-listed alcohol-related diagnoses for U.S. population ages 15 years and older by sex and age group, 1979–97.

Diagnostic category and year	Number of discharges (in 1,000s)							Rate per 10,000 population						
	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years
<b>Any alcohol-related diagnosis</b>														
1997*.....	421	298	123	21	199	146	55	20.2	29.7	11.4	5.8	24.0	26.4	16.2
1996*.....	419	312	107	17	215	139	48	20.3	31.5	10.0	4.7	25.9	25.9	14.3
1995*.....	442	314	128	28	219	149	46	21.7	32.2	12.1	7.8	26.6	28.6	13.7
1994*.....	455	345	110	31	226	147	51	22.6	35.7	10.5	8.6	27.5	28.9	15.5
1993*.....	429	320	109	29	225	126	49	21.5	33.4	10.5	8.1	27.5	25.5	14.9
1992*.....	423	309	114	35	215	123	50	21.4	32.8	11.1	9.9	26.4	25.5	15.5
1991*.....	385	282	103	28	191	116	50	19.7	30.2	10.1	7.7	23.5	24.7	15.9
1990*.....	381	287	94	31	183	123	44	19.7	31.0	9.3	8.5	22.9	26.6	14.1
1989*.....	378	270	109	36	178	120	44	19.5	29.0	10.8	9.6	22.3	26.2	14.4
1988*.....	394	285	108	49	178	120	48	20.5	31.0	10.8	12.8	22.7	26.3	15.9
1987.....	524	387	137	43	263	166	52	27.5	42.3	13.8	11.0	34.1	37.0	17.6
1986.....	594	438	156	53	296	189	56	31.5	48.4	15.9	13.4	39.3	42.4	19.4
1985.....	591	450	141	50	279	199	64	31.7	50.4	14.5	12.5	38.0	44.6	22.4
1984.....	577	416	162	48	262	202	65	31.3	47.0	16.9	12.0	36.7	45.4	23.2
1983.....	584	424	159	48	263	210	63	32.0	48.6	16.8	11.6	37.9	47.3	22.9
1982.....	631	465	166	59	272	233	68	35.0	53.9	17.7	14.0	40.3	52.5	25.2
1981.....	679	501	178	53	287	264	74	38.1	58.8	19.1	12.6	43.9	59.4	28.4
1980.....	668	491	177	47	275	274	72	38.1	58.5	19.4	11.1	43.8	61.7	28.2
1979.....	636	473	163	51	254	269	63	36.7	57.2	18.0	11.9	41.5	60.7	24.9
<b>Alcoholic psychoses</b>														
1997*.....	91	67	24	—	44	34	11	4.4	6.7	2.2	—	5.4	6.1	3.2
1996*.....	90	73	17	—	48	31	8	4.4	7.3	1.6	—	5.8	5.8	2.5
1995*.....	83	63	20	—	42	32	6	4.1	6.5	1.8	—	5.1	6.1	1.9
1994*.....	89	74	15	—	45	34	8	4.4	7.7	1.4	—	5.5	6.6	2.3
1993*.....	66	53	14	—	38	21	6	3.3	5.5	1.3	—	4.6	4.2	1.9
1992*.....	51	41	11	—	28	16	5	2.6	4.3	1.0	—	3.5	3.3	1.7
1991*.....	52	44	8	—	27	18	6	2.7	4.7	0.8	—	3.3	3.8	1.9
1990*.....	45	38	7	—	21	18	5	2.3	4.1	0.7	—	2.6	3.9	1.7
1989*.....	53	42	10	—	25	20	6	2.7	4.6	1.0	—	3.1	4.3	2.0
1988*.....	52	42	10	—	26	17	8	2.7	4.5	1.0	—	3.4	3.7	2.5
1987.....	80	65	15	—	42	28	8	4.2	7.1	1.5	—	5.5	6.3	2.6
1986.....	68	56	13	—	36	22	6	3.6	6.2	1.3	—	4.8	5.0	2.2
1985.....	64	50	14	—	31	21	8	3.4	5.6	1.4	—	4.2	4.8	2.7
1984.....	53	43	10	—	23	22	6	2.9	4.8	1.1	—	3.3	4.9	2.1
1983.....	47	40	7	—	21	18	—	2.6	4.5	0.7	—	3.0	4.1	—
1982.....	58	48	9	—	29	22	—	3.2	5.6	1.0	—	4.3	5.0	—
1981.....	73	59	14	—	35	29	5	4.1	6.9	1.5	—	5.4	6.4	2.0
1980.....	66	52	14	—	32	28	—	3.8	6.2	1.6	—	5.0	6.3	—
1979.....	45	39	7	—	20	18	—	2.6	4.7	0.7	—	3.3	4.1	—
<b>Alcohol dependence syndrome</b>														
1997*.....	206	149	57	12	110	68	15	9.9	14.9	5.2	3.4	13.3	12.3	4.5
1996*.....	217	166	51	12	133	61	12	10.5	16.8	4.8	3.4	16.0	11.3	3.5
1995*.....	261	191	70	21	149	76	15	12.8	19.5	6.6	5.9	18.0	14.6	4.4
1994*.....	260	197	63	23	149	72	15	12.9	20.4	5.9	6.4	18.1	14.3	4.6
1993*.....	261	201	60	23	158	66	14	13.1	21.0	5.8	6.4	19.3	13.2	4.3
1992*.....	269	205	63	25	158	68	18	13.6	21.8	6.2	6.9	19.4	14.1	5.6
1991*.....	242	183	58	20	141	64	17	12.4	19.7	5.7	5.6	17.3	13.6	5.5
1990*.....	248	191	57	24	134	69	20	12.8	20.7	5.6	6.6	16.8	14.9	6.6
1989*.....	227	171	56	29	124	59	15	11.7	18.4	5.6	7.7	15.6	12.8	5.0
1988*.....	243	184	60	40	122	66	15	12.7	19.9	6.0	10.3	15.6	14.6	5.1
1987.....	347	259	88	32	191	98	27	18.2	28.3	8.9	8.1	24.7	21.8	9.1
1986.....	410	314	96	41	223	121	25	21.7	34.7	9.8	10.2	29.6	27.2	8.5
1985.....	401	321	80	33	213	126	29	21.5	35.9	8.3	8.4	29.0	28.3	10.1

See footnotes at end of table.



**Table 1.** Number and rate of first-listed alcohol-related diagnoses for U.S. population ages 15 years and older by sex and age group, 1979–97. (Continued)

Diagnostic category and year	Number of discharges (in 1,000s)							Rate per 10,000 population						
	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years
1984.....	407	299	107	37	203	135	32	22.1	33.9	11.2	9.0	28.4	30.3	11.6
1983.....	401	305	96	36	198	136	31	22.0	34.9	10.1	8.7	28.5	30.7	11.2
1982.....	429	330	99	46	199	150	35	23.8	38.3	10.5	11.0	29.5	33.8	12.9
1981.....	458	355	102	37	213	171	37	25.7	41.6	11.0	8.7	32.6	38.5	14.1
1980.....	449	351	98	35	203	175	36	25.6	41.8	10.8	8.2	32.4	39.4	13.9
1979.....	452	350	102	34	197	187	33	26.1	42.2	11.3	8.1	32.2	42.2	13.2
All chronic liver disease and cirrhosis														
1997*.....	84	49	35	—	24	36	24	4.0	4.9	3.2	—	2.9	6.5	7.0
1996*.....	84	53	31	—	22	38	24	4.1	5.4	2.9	—	2.6	7.0	7.1
1995*.....	77	45	33	—	18	36	22	3.8	4.6	3.1	—	2.2	7.0	6.6
1994*.....	83	56	27	—	20	36	26	4.1	5.8	2.6	—	2.5	7.1	7.8
1993*.....	78	49	29	—	20	32	25	3.9	5.1	2.8	—	2.4	6.5	7.6
1992*.....	73	44	29	—	17	32	24	3.7	4.6	2.8	—	2.0	6.5	7.6
1991*.....	67	38	29	—	16	27	23	3.4	4.1	2.9	—	2.0	5.8	7.3
1990*.....	65	40	25	—	18	31	16	3.4	4.3	2.5	—	2.2	6.6	5.3
1989*.....	75	41	34	—	17	36	20	3.8	4.4	3.4	—	2.2	7.9	6.6
1988*.....	71	43	28	—	18	31	22	3.7	4.7	2.8	—	2.2	6.7	7.4
1987.....	69	41	28	—	19	32	16	3.6	4.5	2.8	—	2.4	7.2	5.4
1986.....	77	40	37	—	17	37	22	4.1	4.4	3.8	—	2.3	8.2	7.7
1985.....	89	51	37	—	20	43	24	4.8	5.7	3.8	—	2.7	9.6	8.5
1984.....	83	48	35	—	21	37	23	4.5	5.4	3.6	—	3.0	8.4	8.3
1983.....	96	54	43	—	26	46	23	5.3	6.1	4.5	—	3.7	10.4	8.5
1982.....	99	56	43	—	25	48	25	5.5	6.5	4.6	—	3.7	10.9	9.2
1981.....	112	62	50	—	25	55	29	6.3	7.3	5.4	—	3.9	12.4	10.9
1980.....	117	64	53	—	26	61	27	6.7	7.6	5.8	—	4.1	13.7	10.7
1979.....	102	58	43	—	23	54	21	5.9	7.0	4.8	—	3.7	12.2	8.3
Alcoholic cirrhosis														
1997*.....	50	36	13	—	18	24	8	2.4	3.6	1.2	—	2.2	4.3	2.3
1996*.....	52	39	13	—	18	26	7	2.5	3.9	1.3	—	2.2	4.9	2.1
1995*.....	45	32	13	—	13	24	8	2.2	3.3	1.2	—	1.6	4.7	2.3
1994*.....	49	36	12	—	13	23	13	2.4	3.8	1.2	—	1.5	4.6	4.0
1993*.....	45	34	11	—	16	19	10	2.3	3.5	1.1	—	1.9	3.8	3.1
1992*.....	42	32	9	—	12	21	9	2.1	3.4	0.9	—	1.5	4.4	2.6
1991*.....	37	26	12	—	11	17	9	1.9	2.7	1.2	—	1.4	3.7	2.9
1990*.....	38	28	10	—	14	18	6	2.0	3.0	1.0	—	1.7	3.9	1.9
1989*.....	36	23	12	—	10	19	6	1.8	2.5	1.2	—	1.2	4.2	2.1
1988*.....	41	31	10	—	12	20	10	2.1	3.4	1.0	—	1.5	4.3	3.2
1987.....	37	25	11	—	13	16	7	1.9	2.7	1.2	—	1.7	3.6	2.3
1986.....	35	23	12	—	10	19	6	1.9	2.6	1.2	—	1.4	4.2	2.1
1985.....	40	27	13	—	12	21	7	2.1	3.0	1.3	—	1.6	4.7	2.4
1984.....	37	25	12	—	13	19	—	2.0	2.8	1.3	—	1.8	4.2	—
1983.....	33	22	11	—	12	16	—	1.8	2.6	1.1	—	1.7	3.7	—
1982.....	38	25	13	—	12	21	5	2.1	2.9	1.4	—	1.8	4.6	2.0
1981.....	46	27	19	—	12	22	10	2.6	3.2	2.0	—	1.9	5.0	3.7
1980.....	42	26	16	—	12	23	7	2.4	3.1	1.8	—	2.0	5.1	2.6
1979.....	41	28	13	—	12	24	6	2.4	3.4	1.4	—	1.9	5.3	2.3
Other specified cirrhosis														
1997*.....	9	—	6	—	—	—	—	0.4	—	0.6	—	—	—	—
1996*.....	6	—	2	—	—	—	—	0.3	—	0.2	—	—	—	—
1995*.....	9	—	8	—	—	—	—	0.5	—	0.7	—	—	—	—
1994*.....	10	—	5	—	—	—	—	0.5	—	0.5	—	—	—	—
1993*.....	11	4	6	—	—	6	—	0.5	0.5	0.6	—	—	1.2	—
1992*.....	9	3	6	—	—	3	—	0.5	0.3	0.6	—	—	0.6	—
1991*.....	11	4	7	—	—	4	—	0.5	0.4	0.6	—	—	0.9	—

See footnotes at end of table.

**Table 1.** Number and rate of first-listed alcohol-related diagnoses for U.S. population ages 15 years and older by sex and age group, 1979–97. (Continued)

Diagnostic category and year	Number of discharges (in 1,000s)							Rate per 10,000 population						
	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years
1990*.....	9	4	5	—	—	4	—	0.5	0.4	0.5	—	—	1.0	—
1989*.....	14	7	7	—	4	6	—	0.7	0.7	0.7	—	0.5	1.3	—
1988*.....	9	4	5	—	3	3	—	0.4	0.4	0.5	—	0.4	0.7	—
1987.....	14	7	7	—	—	6	—	0.7	0.7	0.7	—	—	1.4	—
1986.....	12	6	6	—	—	—	—	0.7	0.7	0.6	—	—	—	—
1985.....	18	10	8	—	—	8	—	1.0	1.1	0.9	—	—	1.7	—
1984.....	18	7	10	—	—	—	—	1.0	0.8	1.1	—	—	—	—
1983.....	23	10	13	—	6	11	—	1.3	1.1	1.4	—	0.9	2.5	—
1982.....	19	8	12	—	6	7	—	1.1	0.9	1.2	—	1.0	1.6	—
1981.....	23	11	11	—	7	10	—	1.3	1.3	1.2	—	1.1	2.2	—
1980.....	25	9	16	—	6	11	5	1.4	1.1	1.7	—	1.0	2.6	2.1
1979.....	21	7	13	—	—	10	—	1.2	0.9	1.5	—	—	2.2	—
Unspecified cirrhosis														
1997*.....	25	9	16	—	—	10	13	1.2	0.9	1.4	—	—	1.7	3.8
1996*.....	26	11	15	—	—	9	14	1.3	1.1	1.4	—	—	1.7	4.2
1995*.....	23	11	12	—	—	9	13	1.1	1.1	1.1	—	—	1.6	3.8
1994*.....	24	14	10	—	—	10	10	1.2	1.5	0.9	—	—	1.9	3.0
1993*.....	22	11	11	—	—	7	12	1.1	1.1	1.1	—	—	1.4	3.7
1992*.....	22	8	14	—	—	8	11	1.1	0.9	1.3	—	—	1.6	3.5
1991*.....	19	8	11	—	—	6	11	1.0	0.9	1.1	—	—	1.3	3.4
1990*.....	18	8	10	—	—	8	8	0.9	0.9	1.0	—	—	1.8	2.6
1989*.....	25	11	14	—	—	11	10	1.3	1.2	1.4	—	—	2.5	3.4
1988*.....	21	8	13	—	—	8	10	1.1	0.9	1.3	—	—	1.7	3.4
1987.....	18	10	9	—	—	10	6	1.0	1.0	0.9	—	—	2.3	2.1
1986.....	29	10	19	—	—	13	12	1.6	1.1	1.9	—	—	3.0	4.2
1985.....	31	15	16	—	—	14	14	1.6	1.6	1.6	—	—	3.2	5.0
1984.....	28	16	12	—	—	12	13	1.5	1.8	1.3	—	—	2.8	4.7
1983.....	41	21	19	—	8	19	14	2.2	2.4	2.0	—	1.1	4.3	5.0
1982.....	42	23	19	—	7	21	14	2.3	2.7	2.0	—	1.0	4.7	5.3
1981.....	43	24	20	—	6	23	14	2.4	2.8	2.1	—	0.9	5.2	5.5
1980.....	50	29	21	—	7	27	15	2.8	3.4	2.3	—	1.2	6.0	6.0
1979.....	40	23	17	—	6	21	11	2.3	2.7	1.9	—	1.0	4.7	4.6
Nondependent abuse of alcohol														
1997*.....	40	32	8	7	20	8	—	1.9	3.2	0.7	1.9	2.4	1.5	—
1996*.....	28	20	8	—	12	9	—	1.4	2.0	0.7	—	1.5	1.7	—
1995*.....	21	16	5	—	10	4	—	1.0	1.6	0.5	—	1.2	0.9	—
1994*.....	24	18	5	5	12	4	—	1.2	1.9	0.5	1.3	1.5	0.8	—
1993*.....	24	17	7	4	9	7	—	1.2	1.8	0.6	1.0	1.1	1.5	—
1992*.....	30	19	11	9	12	8	—	1.5	2.1	1.0	2.4	1.5	1.6	—
1991*.....	24	17	8	5	8	7	—	1.3	1.8	0.8	1.5	1.0	1.5	—
1990*.....	24	18	6	6	11	5	—	1.2	2.0	0.6	1.7	1.4	1.1	—
1989*.....	24	16	9	5	12	5	—	1.3	1.7	0.9	1.3	1.5	1.1	—
1988*.....	28	17	11	8	11	6	—	1.4	1.8	1.1	2.1	1.5	1.3	—
1987.....	28	22	6	8	11	8	—	1.5	2.4	0.6	2.0	1.5	1.7	—
1986.....	39	29	11	9	19	9	—	2.1	3.2	1.1	2.1	2.6	1.9	—
1985.....	38	28	10	11	15	9	—	2.0	3.2	1.0	2.7	2.1	1.9	—
1984.....	35	25	10	9	14	8	—	1.9	2.9	1.0	2.3	2.0	1.9	—
1983.....	40	26	13	8	19	9	—	2.2	3.0	1.4	2.0	2.7	2.1	—
1982.....	46	31	15	10	19	13	—	2.5	3.6	1.6	2.5	2.8	2.9	—
1981.....	37	26	11	10	14	10	—	2.1	3.0	1.2	2.3	2.1	2.1	—
1980.....	36	24	12	8	14	10	—	2.1	2.9	1.3	2.0	2.2	2.2	—
1979.....	37	26	11	10	14	10	—	2.1	3.2	1.2	2.5	2.2	2.2	—

\* New sample design was implemented, which may affect trend data. Some of the differences between the 1988–97 statistics and those of earlier years may be due to sampling error rather than changes in hospital utilization patterns.

— There were fewer than 30 NHDS records for this cell of the table. Data are not reported because of questionable reliability.

**Table 2.** Number and rate of all-listed alcohol-related diagnoses for U.S. population ages 15 years and older by sex and age group, 1979–97.

Diagnostic category and year	Number of discharges (in 1,000s)							Rate per 10,000 population						
	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years
<b>Any alcohol-related diagnosis</b>														
1997*	1,345	923	423	79	556	458	251	64.5	92.0	39.1	22.0	67.1	82.7	73.7
1996*	1,342	938	404	72	594	438	238	65.0	94.6	37.7	20.2	71.6	81.5	70.2
1995*	1,317	904	413	96	591	413	217	64.6	92.6	38.9	27.1	71.6	79.1	64.6
1994*	1,300	919	381	90	582	412	215	64.5	95.2	36.2	25.5	70.8	81.0	65.0
1993*	1,226	880	347	76	561	372	216	61.4	92.1	33.3	21.6	68.6	75.1	66.0
1992*	1,175	814	361	90	515	357	213	59.5	86.2	35.0	25.4	63.2	74.0	65.8
1991*	1,066	753	312	83	465	317	201	54.5	80.7	30.6	23.2	57.2	67.8	63.3
1990*	1,021	717	304	86	432	314	189	52.7	77.6	30.0	23.7	54.0	67.9	60.7
1989*	1,020	702	318	94	412	324	190	52.7	75.5	31.6	25.0	51.8	70.7	62.1
1988*	979	670	309	102	390	315	172	51.0	72.6	31.0	26.6	49.8	69.3	57.2
1987	1,136	817	319	93	476	378	189	59.7	89.3	32.3	23.8	61.8	84.4	63.8
1986	1,198	847	351	96	497	406	199	63.5	93.6	35.8	24.2	65.9	91.1	68.7
1985	1,112	798	314	86	436	408	181	59.6	89.2	32.3	21.4	59.5	91.5	63.9
1984	1,084	752	331	81	421	391	191	58.8	85.1	34.5	19.9	58.9	87.9	68.6
1983	1,060	741	319	79	406	395	180	58.1	84.8	33.5	19.3	58.4	88.8	65.9
1982	1,093	781	312	91	410	415	177	60.6	90.4	33.2	21.8	60.8	93.4	66.2
1981	1,125	798	326	86	415	453	171	63.1	93.6	35.1	20.2	63.5	101.9	65.4
1980	1,092	781	311	74	395	454	170	62.3	93.2	34.0	17.4	62.9	102.0	66.5
1979	1,045	757	288	78	369	446	151	60.4	91.4	31.9	18.4	60.3	100.6	60.4
<b>Alcoholic psychoses</b>														
1997*	206	155	50	—	93	75	33	9.9	15.5	4.7	—	11.2	13.6	9.8
1996*	203	155	48	—	92	66	42	9.8	15.7	4.5	—	11.1	12.3	12.4
1995*	180	138	42	5	84	67	23	8.8	14.1	4.0	1.5	10.2	12.9	6.9
1994*	198	162	37	4	83	80	31	9.8	16.7	3.5	1.2	10.1	15.7	9.4
1993*	181	143	38	4	85	66	27	9.1	15.0	3.6	1.3	10.4	13.2	8.1
1992*	162	129	33	5	74	56	28	8.2	13.7	3.2	1.4	9.0	11.6	8.6
1991*	153	122	31	4	67	60	23	7.8	13.1	3.0	1.1	8.2	12.7	7.3
1990*	129	106	23	4	53	49	22	6.6	11.4	2.3	1.0	6.7	10.6	7.2
1989*	130	100	30	5	52	49	24	6.7	10.7	3.0	1.3	6.6	10.6	7.9
1988*	129	99	31	—	55	46	23	6.7	10.7	3.1	—	7.0	10.2	7.5
1987	164	128	36	—	76	60	25	8.6	14.0	3.7	—	9.9	13.3	8.5
1986	171	136	36	6	80	63	23	9.1	15.0	3.7	1.5	10.6	14.1	8.0
1985	160	129	31	7	73	58	21	8.6	14.4	3.2	1.7	10.0	13.1	7.5
1984	141	109	31	6	57	58	20	7.6	12.4	3.3	1.4	8.0	13.0	7.1
1983	116	93	22	—	49	45	17	6.3	10.7	2.3	—	7.1	10.2	6.2
1982	130	103	26	—	55	54	17	7.2	12.0	2.8	—	8.2	12.2	6.4
1981	142	114	28	6	58	61	17	8.0	13.4	3.0	1.4	8.9	13.8	6.3
1980	129	101	28	—	57	57	13	7.4	12.1	3.1	—	9.0	12.8	5.2
1979	115	97	18	—	44	53	15	6.6	11.7	2.0	—	7.2	11.9	5.8
<b>Alcohol dependence syndrome</b>														
1997*	757	548	209	35	350	275	97	36.3	54.7	19.3	9.7	42.2	49.6	28.6
1996*	787	592	195	39	392	259	97	38.2	59.7	18.2	10.9	47.3	48.2	28.7
1995*	853	618	235	59	423	275	95	41.9	63.3	22.1	16.6	51.3	52.7	28.4
1994*	775	578	197	49	390	247	90	38.5	59.9	18.7	13.8	47.4	48.5	27.2
1993*	752	568	183	44	393	228	87	37.7	59.5	17.6	12.5	48.0	46.0	26.4
1992*	745	552	193	51	375	226	92	37.7	58.4	18.7	14.4	46.1	46.9	28.6
1991*	654	491	164	46	332	192	85	33.5	52.6	16.0	13.0	40.8	41.0	26.7
1990*	647	484	163	55	311	202	79	33.4	52.3	16.1	15.1	38.9	43.7	25.4
1989*	646	481	165	65	302	196	84	33.4	51.7	16.5	17.3	37.9	42.7	27.4
1988*	647	468	179	74	289	204	80	33.7	50.7	18.0	19.5	36.9	44.8	26.6
1987	785	593	192	66	372	252	95	41.2	64.8	19.4	16.8	48.2	56.3	32.1
1986	828	621	208	72	390	271	95	43.9	68.6	21.2	18.1	51.8	60.8	32.8
1985	756	578	179	58	347	267	85	40.6	64.6	18.4	14.4	47.2	59.9	29.9

See footnotes at end of table.

**Table 2.** Number and rate of all-listed alcohol-related diagnoses for U.S. population ages 15 years and older by sex and age group, 1979–97. (Continued)

Diagnostic category and year	Number of discharges (in 1,000s)							Rate per 10,000 population						
	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years
1984.....	760	557	204	61	333	273	93	41.2	63.0	21.2	15.1	46.7	61.3	33.3
1983.....	721	536	185	59	314	261	86	39.5	61.4	19.4	14.4	45.3	58.8	31.5
1982.....	749	567	182	67	313	277	92	41.5	65.6	19.4	16.0	46.4	62.3	34.5
1981.....	775	585	189	61	322	307	85	43.5	68.6	20.4	14.5	49.3	68.9	32.6
1980.....	746	573	173	51	307	303	85	42.6	68.3	18.9	12.1	49.0	68.0	33.2
1979.....	724	554	170	53	287	304	80	41.8	66.9	18.9	12.5	46.9	68.6	31.7
All chronic liver disease and cirrhosis														
1997*.....	330	197	133	2	76	131	120	15.8	19.7	12.3	0.7	9.2	23.7	35.3
1996*.....	346	209	136	—	86	147	110	16.8	21.1	12.7	—	10.3	27.4	32.5
1995*.....	322	186	136	—	81	133	106	15.8	19.1	12.8	—	9.8	25.4	31.5
1994*.....	328	198	130	—	87	133	105	16.3	20.5	12.4	—	10.6	26.2	31.6
1993*.....	313	197	116	—	79	123	107	15.7	20.6	11.2	—	9.6	24.9	32.7
1992*.....	304	185	119	5	75	117	107	15.4	19.6	11.5	1.5	9.2	24.3	33.1
1991*.....	275	168	107	3	71	106	94	14.1	18.0	10.4	0.9	8.8	22.8	29.6
1990*.....	271	162	109	3	68	102	98	14.0	17.5	10.7	0.9	8.4	22.0	31.3
1989*.....	293	167	126	8	67	117	100	15.1	18.0	12.5	2.2	8.5	25.5	32.6
1988*.....	259	151	108	—	67	109	79	13.5	16.3	10.8	—	8.5	23.9	26.2
1987.....	295	183	113	—	73	129	89	15.5	20.0	11.4	—	9.4	28.8	30.0
1986.....	313	181	132	5	71	141	95	16.6	20.0	13.4	1.2	9.5	31.7	32.9
1985.....	306	184	122	—	66	147	90	16.4	20.6	12.6	—	8.9	33.0	31.7
1984.....	304	185	119	—	75	125	101	16.5	21.0	12.4	—	10.5	28.0	36.3
1983.....	317	192	125	7	77	140	93	17.4	22.0	13.2	1.7	11.1	31.5	34.1
1982.....	309	191	119	—	79	143	82	17.2	22.1	12.6	—	11.8	32.1	30.6
1981.....	325	194	131	7	77	156	86	18.2	22.8	14.1	1.6	11.8	35.1	32.7
1980.....	315	188	128	6	71	152	85	18.0	22.4	13.9	1.5	11.3	34.2	33.4
1979.....	299	185	114	7	68	152	72	17.2	22.3	12.6	1.6	11.1	34.2	28.7
Alcoholic cirrhosis														
1997*.....	182	131	51	—	56	82	43	8.7	13.0	4.7	—	6.7	14.9	12.6
1996*.....	200	145	55	—	61	98	41	9.7	14.6	5.2	—	7.4	18.2	12.0
1995*.....	179	124	55	—	59	81	37	8.8	12.7	5.2	—	7.2	15.6	10.9
1994*.....	193	138	55	—	61	87	45	9.6	14.3	5.2	—	7.4	17.0	13.6
1993*.....	178	135	43	—	59	78	39	8.9	14.1	4.1	—	7.2	15.8	11.8
1992*.....	167	125	42	—	55	73	37	8.4	13.2	4.1	—	6.8	15.2	11.3
1991*.....	149	106	43	—	50	66	33	7.6	11.4	4.2	—	6.1	14.1	10.2
1990*.....	150	109	41	—	49	62	37	7.7	11.8	4.0	—	6.1	13.5	12.0
1989*.....	143	101	42	—	41	64	36	7.4	10.8	4.2	—	5.2	13.9	11.6
1988*.....	144	104	40	—	44	68	28	7.5	11.2	4.0	—	5.7	14.9	9.3
1987.....	163	118	46	—	49	79	33	8.6	12.9	4.6	—	6.3	17.6	11.2
1986.....	159	111	47	—	50	78	28	8.4	12.3	4.8	—	6.6	17.5	9.8
1985.....	152	104	48	—	46	78	27	8.2	11.6	5.0	—	6.3	17.6	9.3
1984.....	142	103	39	—	44	71	26	7.7	11.7	4.0	—	6.1	15.8	9.2
1983.....	140	101	39	—	48	65	24	7.7	11.6	4.1	—	6.9	14.7	8.8
1982.....	149	108	41	—	53	71	23	8.3	12.5	4.3	—	7.8	16.1	8.6
1981.....	152	105	47	—	47	75	27	8.5	12.3	5.1	—	7.2	16.9	10.2
1980.....	137	98	39	—	45	65	26	7.8	11.7	4.3	—	7.1	14.6	10.2
1979.....	137	98	39	—	41	72	23	7.9	11.9	4.3	—	6.7	16.3	9.0
Other specified cirrhosis														
1997*.....	71	32	39	—	14	28	28	3.4	3.2	3.6	—	1.7	5.1	8.1
1996*.....	81	41	40	—	18	35	27	3.9	4.2	3.7	—	2.1	6.5	8.0
1995*.....	70	31	39	—	19	26	25	3.5	3.2	3.7	—	2.2	4.9	7.3
1994*.....	76	36	40	—	22	24	29	3.8	3.7	3.8	—	2.6	4.7	8.8
1993*.....	68	35	34	—	14	28	25	3.4	3.6	3.2	—	1.7	5.6	7.6
1992*.....	70	33	37	—	17	21	28	3.5	3.5	3.6	—	2.1	4.4	8.8
1991*.....	74	38	36	—	19	28	26	3.8	4.1	3.5	—	2.3	6.0	8.1

See footnotes at end of table.

**Table 2.** Number and rate of all-listed alcohol-related diagnoses for U.S. population ages 15 years and older by sex and age group, 1979–97. (Continued)

Diagnostic category and year	Number of discharges (in 1,000s)							Rate per 10,000 population						
	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years	Total	Male	Female	15-24 years	25-44 years	45-64 years	65+ years
1990*.....	62	28	34	—	14	23	23	3.2	3.0	3.3	—	1.8	5.0	7.3
1989*.....	72	29	43	—	20	27	20	3.7	3.1	4.3	—	2.5	6.0	6.4
1988*.....	60	26	34	—	20	22	17	3.1	2.8	3.4	—	2.5	4.8	5.7
1987.....	69	35	34	—	17	28	21	3.6	3.8	3.4	—	2.2	6.3	7.1
1986.....	73	32	42	—	16	30	25	3.9	3.5	4.3	—	2.1	6.8	8.7
1985.....	70	35	35	—	16	32	19	3.7	3.9	3.6	—	2.2	7.2	6.8
1984.....	72	31	41	—	20	27	24	3.9	3.5	4.2	—	2.8	6.0	8.7
1983.....	78	36	42	—	19	33	23	4.3	4.1	4.5	—	2.8	7.4	8.5
1982.....	74	35	39	—	20	30	22	4.1	4.0	4.2	—	2.9	6.7	8.2
1981.....	74	34	40	—	17	35	18	4.1	3.9	4.3	—	2.7	7.9	7.0
1980.....	69	31	38	—	14	34	17	4.0	3.7	4.2	—	2.3	7.6	6.6
1979.....	61	26	34	—	15	27	15	3.5	3.2	3.8	—	2.4	6.2	6.0
Unspecified cirrhosis														
1997*.....	106	49	57	—	13	33	60	5.1	4.9	5.3	—	1.5	5.9	17.6
1996*.....	103	46	57	—	14	36	52	5.0	4.6	5.3	—	1.7	6.7	15.3
1995*.....	103	48	55	—	10	41	52	5.1	4.9	5.2	—	1.2	7.8	15.6
1994*.....	92	44	48	—	13	35	43	4.5	4.6	4.5	—	1.6	6.9	13.0
1993*.....	91	42	48	—	11	29	51	4.6	4.4	4.7	—	1.3	5.8	15.6
1992*.....	93	42	51	—	8	30	54	4.7	4.5	4.9	—	0.9	6.3	16.7
1991*.....	78	39	39	—	9	25	44	4.0	4.2	3.8	—	1.1	5.4	13.8
1990*.....	82	37	46	—	7	27	47	4.3	4.0	4.5	—	0.9	5.8	14.9
1989*.....	104	49	55	—	12	38	52	5.4	5.3	5.5	—	1.5	8.3	17.1
1988*.....	77	32	45	—	9	29	40	4.0	3.5	4.5	—	1.1	6.4	13.1
1987.....	87	43	44	—	10	36	41	4.6	4.7	4.4	—	1.3	8.0	13.7
1986.....	105	50	55	—	11	43	50	5.6	5.6	5.6	—	1.5	9.6	17.4
1985.....	108	57	51	—	8	49	50	5.8	6.4	5.2	—	1.0	11.0	17.5
1984.....	115	66	49	—	16	39	60	6.2	7.5	5.1	—	2.3	8.8	21.5
1983.....	125	69	56	—	17	54	53	6.8	7.9	5.9	—	2.4	12.1	19.2
1982.....	113	65	48	—	16	52	44	6.3	7.5	5.2	—	2.4	11.7	16.5
1981.....	121	66	55	—	17	57	46	6.8	7.8	5.9	—	2.6	12.8	17.7
1980.....	129	72	58	—	16	64	48	7.4	8.5	6.3	—	2.6	14.4	18.7
1979.....	116	70	46	—	15	62	37	6.7	8.4	5.1	—	2.4	13.9	14.9
Nondependent abuse of alcohol														
1997*.....	364	256	108	42	170	104	48	17.5	25.5	10.0	11.7	20.5	18.7	14.2
1996*.....	322	227	95	32	159	94	37	15.6	22.9	8.9	8.8	19.2	17.6	11.0
1995*.....	246	173	73	35	129	56	26	12.1	17.8	6.9	9.9	15.7	10.7	7.7
1994*.....	298	215	83	40	148	79	30	14.8	22.3	7.9	11.4	18.0	15.6	9.1
1993*.....	251	183	68	30	130	63	28	12.6	19.2	6.5	8.5	15.9	12.7	8.4
1992*.....	221	150	71	35	108	55	23	11.2	15.9	6.9	9.9	13.2	11.4	7.1
1991*.....	204	144	60	33	97	47	27	10.4	15.4	5.8	9.3	11.9	10.1	8.4
1990*.....	177	129	48	29	89	43	16	9.1	13.9	4.8	8.0	11.1	9.3	5.2
1989*.....	142	96	46	22	72	33	15	7.3	10.4	4.5	5.9	9.0	7.2	5.0
1988*.....	129	89	40	26	56	32	14	6.7	9.7	4.0	6.9	7.2	7.1	4.8
1987.....	114	84	30	24	50	28	12	6.0	9.2	3.0	6.1	6.5	6.2	4.1
1986.....	116	84	31	20	56	27	12	6.1	9.3	3.2	5.1	7.5	6.0	4.2
1985.....	99	68	30	23	39	27	11	5.3	7.6	3.1	5.7	5.3	6.0	3.8
1984.....	76	53	22	17	33	20	6	4.1	6.0	2.3	4.1	4.6	4.6	2.1
1983.....	80	54	26	15	37	20	8	4.4	6.2	2.7	3.7	5.3	4.5	3.0
1982.....	89	60	28	20	37	24	8	4.9	7.0	3.0	4.8	5.4	5.5	2.9
1981.....	75	53	22	18	29	23	6	4.2	6.2	2.4	4.3	4.4	5.1	2.4
1980.....	74	52	23	16	29	20	9	4.2	6.2	2.5	3.8	4.6	4.5	3.6
1979.....	75	53	22	19	27	23	6	4.3	6.4	2.4	4.5	4.4	5.2	2.2

\* New sample design was implemented, which may affect trend data. Some of the differences between the 1988–97 statistics and those of earlier years may be due to sampling error rather than changes in hospital utilization patterns.

—There were fewer than 30 NHDS records for this cell of the table. Data are not reported because of questionable reliability.

**Table 3.** Average length of stay (in days) for first-listed alcohol-related diagnoses, by sex and age group, 1979–97.

Sex or age and year	Alcoholic psychoses	Alcohol dependence syndrome	Chronic liver disease and cirrhosis				Nondependent abuse of alcohol
			Any	Alcoholic	Other specified	Unspecified	
U.S. total							
1997* .....	5.7	6.3	7.2	7.8	4.1	7.3	4.5
1996* .....	5.4	6.6	6.1	6.2	4.9	6.1	4.9
1995* .....	5.3	7.0	6.8	7.5	5.0	6.1	2.7
1994* .....	5.6	7.7	7.4	7.9	4.9	7.5	3.1
1993* .....	5.4	8.2	8.5	9.0	5.5	9.0	3.6
1992* .....	5.5	8.8	9.7	8.7	9.3	11.6	2.6
1991* .....	6.4	9.1	8.4	8.6	6.7	8.9	4.2
1990* .....	6.0	9.5	9.9	10.3	6.6	10.9	3.2
1989* .....	6.1	10.3	10.0	12.0	5.4	9.5	3.8
1988* .....	5.8	10.7	8.8	9.4	5.0	9.2	6.9
1987 .....	6.7	10.7	8.7	9.3	7.2	8.7	3.2
1986 .....	6.3	10.4	8.0	8.6	6.1	8.1	3.8
1985 .....	7.3	10.4	8.4	8.8	6.0	9.4	4.6
1984 .....	5.9	10.3	10.6	11.1	9.8	10.5	3.6
1983 .....	6.6	11.2	10.2	10.3	7.8	11.5	4.0
1982 .....	7.1	10.9	11.5	12.0	8.3	12.5	3.6
1981 .....	7.1	10.3	12.1	11.8	6.7	15.3	3.4
1980 .....	6.6	9.9	11.8	12.1	7.6	13.7	4.5
1979 .....	7.2	9.1	12.6	12.7	8.4	14.8	2.8
Sex: male							
1997* .....	5.7	5.9	7.3	7.1	—	8.9	4.4
1996* .....	5.0	6.4	6.1	6.2	—	6.0	5.1
1995* .....	5.2	6.8	7.1	7.6	—	5.8	2.9
1994* .....	5.5	7.3	6.6	7.1	—	6.3	3.2
1993* .....	5.6	8.0	8.7	8.3	5.9	11.1	2.8
1992* .....	5.6	8.7	9.2	9.0	4.6	11.6	3.0
1991* .....	6.1	8.7	8.0	8.4	8.4	6.4	3.5
1990* .....	6.1	9.5	10.7	10.8	6.5	12.2	2.5
1989* .....	5.8	10.2	9.2	10.9	4.7	8.4	4.6
1988* .....	5.8	10.5	8.3	8.9	5.2	7.2	7.2
1987 .....	7.0	10.3	7.7	8.0	5.7	8.1	3.2
1986 .....	6.4	10.2	7.0	7.4	5.3	7.3	3.5
1985 .....	5.6	10.4	8.0	8.1	6.7	8.7	5.0
1984 .....	6.1	10.0	10.6	10.4	11.7	10.4	3.8
1983 .....	6.7	10.9	10.2	9.6	8.9	11.4	4.2
1982 .....	7.2	10.3	10.4	11.0	5.8	11.2	3.9
1981 .....	7.2	10.1	11.4	10.6	6.3	14.8	3.6
1980 .....	6.4	9.8	11.6	11.8	6.6	12.9	4.7
1979 .....	6.6	9.1	11.6	11.3	7.6	13.3	3.0
Sex: female							
1997* .....	5.5	7.3	7.1	9.6	3.7	6.3	4.7
1996* .....	7.4	7.2	6.1	6.4	3.6	6.2	4.3
1995* .....	5.5	7.5	6.3	7.2	4.7	6.3	2.0
1994* .....	6.1	9.0	9.0	10.2	5.4	9.3	2.9
1993* .....	4.4	9.0	8.1	11.0	5.1	6.9	5.8
1992* .....	5.2	9.0	10.4	7.7	11.6	11.7	1.9
1991* .....	8.4	10.3	8.9	9.1	5.6	10.8	5.5
1990* .....	5.4	9.6	8.8	8.9	6.6	9.7	5.3
1989* .....	7.4	10.5	10.8	14.2	6.1	10.3	2.2
1988* .....	5.5	11.2	9.7	11.2	4.8	10.5	6.6
1987 .....	5.4	11.6	10.3	12.2	8.6	9.3	3.2
1986 .....	5.9	11.0	9.1	10.9	7.1	8.6	4.7
1985 .....	13.3	10.5	9.0	10.1	5.2	10.0	3.5

See footnotes at end of table.

**Table 3.** Average length of stay (in days) for first-listed alcohol-related diagnoses, by sex and age group, 1979–97. (Continued)

Sex or age and year	Alcoholic psychoses	Alcohol dependence syndrome	Chronic liver disease and cirrhosis				Nondependent abuse of alcohol
			Any	Alcoholic	Other specified	Unspecified	
1984 .....	5.2	10.9	10.7	12.7	8.4	10.6	3.1
1983 .....	6.3	12.1	10.2	11.9	6.9	11.6	3.6
1982 .....	6.9	12.6	13.0	14.0	9.9	14.1	3.0
1981 .....	7.0	11.1	13.0	13.4	7.1	15.9	2.9
1980 .....	7.4	10.4	12.2	12.6	8.1	14.9	4.0
1979 .....	10.7	9.0	13.9	15.6	8.8	16.6	2.5
Age: 15-24 years							
1997* .....	—	7.8	—	—	—	—	6.2
1996* .....	—	11.3	—	—	—	—	—
1995* .....	—	10.2	—	—	—	—	—
1994* .....	—	11.7	—	—	—	—	3.3
1993* .....	—	10.9	—	—	—	—	4.9
1992* .....	—	12.1	—	—	—	—	1.6
1991* .....	—	12.4	—	—	—	—	5.2
1990* .....	—	11.9	—	—	—	—	1.9
1989* .....	—	15.0	—	—	—	—	2.7
1988* .....	—	13.8	—	—	—	—	9.7
1987 .....	—	13.2	—	—	—	—	2.7
1986 .....	—	12.6	—	—	—	—	3.0
1985 .....	—	13.4	—	—	—	—	3.7
1984 .....	—	13.2	—	—	—	—	2.2
1983 .....	—	13.6	—	—	—	—	3.2
1982 .....	—	14.8	—	—	—	—	2.3
1981 .....	—	11.9	—	—	—	—	2.0
1980 .....	—	12.7	—	—	—	—	1.6
1979 .....	—	9.8	—	—	—	—	1.7
Age: 25-44 years							
1997* .....	5.1	5.4	7.7	8.4	—	—	4.4
1996* .....	5.2	6.4	5.9	6.2	—	—	4.2
1995* .....	4.9	6.6	6.2	6.8	—	—	2.6
1994* .....	4.8	7.4	8.1	8.0	—	—	3.1
1993* .....	4.7	7.7	7.9	7.7	—	—	3.2
1992* .....	5.0	8.7	9.3	8.7	—	—	2.1
1991* .....	5.6	9.1	8.5	8.7	—	—	3.8
1990* .....	4.8	9.3	7.3	7.5	—	—	4.6
1989* .....	5.8	10.0	8.9	11.2	4.2	—	4.2
1988* .....	4.8	11.0	7.1	7.5	4.2	—	6.4
1987 .....	5.3	10.5	8.1	9.4	—	—	3.2
1986 .....	5.7	9.8	6.7	7.9	—	—	4.2
1985 .....	5.6	10.3	7.5	8.3	—	—	4.9
1984 .....	5.6	9.8	8.8	9.0	—	—	3.4
1983 .....	6.2	11.0	8.8	8.1	8.5	10.2	4.2
1982 .....	5.8	10.0	10.9	12.8	5.9	12.1	4.3
1981 .....	6.3	9.8	8.4	8.4	5.3	12.0	3.9
1980 .....	6.1	9.1	9.8	10.8	8.7	9.2	4.8
1979 .....	6.1	9.4	10.9	11.7	—	12.9	2.6
Age: 45-64 years							
1997* .....	4.9	7.1	7.1	6.9	—	7.9	3.7
1996* .....	5.1	5.5	6.0	6.1	—	6.0	4.7
1995* .....	5.2	6.8	6.9	7.7	—	5.8	3.2
1994* .....	5.9	7.1	6.8	7.3	—	6.2	2.5
1993* .....	5.9	8.2	7.8	9.2	3.5	7.9	2.6
1992* .....	5.7	7.6	9.2	8.5	5.7	12.5	3.8
1991* .....	7.1	8.2	7.6	8.4	4.9	7.0	4.3

See footnotes at end of table.

**Table 3.** Average length of stay (in days) for first-listed alcohol-related diagnoses, by sex and age group, 1979–97. (Continued)

Sex or age and year	Alcoholic psychoses	Alcohol dependence syndrome	Chronic liver disease and cirrhosis				Nondependent abuse of alcohol
			Any	Alcoholic	Other specified	Unspecified	
1990* .....	6.6	9.0	11.5	13.1	6.4	10.9	1.9
1989* .....	6.0	8.1	11.1	13.4	4.9	10.3	3.1
1988* .....	6.0	8.7	9.7	10.3	4.1	10.3	4.6
1987 .....	7.3	10.1	9.3	10.2	8.2	8.4	3.9
1986 .....	6.7	10.3	8.0	9.1	—	7.1	3.5
1985 .....	10.7	9.6	9.0	9.5	6.2	9.8	5.4
1984 .....	6.0	9.6	10.9	11.8	—	12.1	5.4
1983 .....	6.3	10.5	9.7	11.0	6.0	10.8	3.5
1982 .....	8.0	10.5	11.2	11.6	6.4	12.4	3.7
1981 .....	7.8	10.2	13.0	12.7	8.7	15.2	3.4
1980 .....	7.1	10.3	12.5	13.0	7.0	14.3	5.8
1979 .....	7.4	8.7	12.9	13.1	7.6	15.3	3.3
Age: 65+ years							
1997* .....	10.5	7.9	7.0	8.9	—	6.7	—
1996* .....	7.3	8.4	6.4	7.1	—	6.2	—
1995* .....	6.1	7.3	7.2	8.0	—	6.4	—
1994* .....	7.8	8.0	7.7	8.6	—	7.6	—
1993* .....	8.2	9.1	9.8	10.8	—	9.5	—
1992* .....	8.9	8.8	10.6	9.2	—	10.8	—
1991* .....	8.3	9.4	9.3	8.9	—	10.1	—
1990* .....	8.1	9.4	9.9	8.8	—	11.3	—
1989* .....	8.1	11.8	8.9	9.3	—	9.2	—
1988* .....	7.1	8.4	9.1	10.0	—	8.5	—
1987 .....	11.8	10.6	8.8	7.5	—	9.6	—
1986 .....	9.4	12.7	9.1	8.1	—	10.3	—
1985 .....	6.8	11.7	8.4	7.5	—	9.0	—
1984 .....	7.7	12.9	12.2	—	—	9.0	—
1983 .....	—	12.0	13.0	—	—	13.3	—
1982 .....	—	12.0	13.1	11.8	—	12.9	—
1981 .....	11.4	11.9	13.2	13.2	—	15.9	—
1980 .....	—	9.8	12.9	12.0	8.1	14.9	—
1979 .....	—	9.2	13.7	13.2	—	15.3	—

Note: Analyses of length-of-stay data for years 1993–95 in previous surveillance reports inadvertently recorded hospital stays equal to less than one full day as equal to one day. This has been corrected in this report, with such stays recoded as equal to zero in calculations for figure 9 and table 3.

\* New sample design was implemented, which may affect trend data. Some of the differences between the 1988–97 statistics and those of earlier years may be due to sampling error rather than changes in hospital utilization patterns.

— There were fewer than 30 NHDS records for this cell of the table. Data are not reported because of questionable reliability.

<sup>1</sup> A single discharge case, a patient who was hospitalized for 217 days with complications from a liver transplant, had a major impact on the average length of stay calculations for “any chronic liver disease and cirrhosis” and “other specified cirrhosis without mention of alcohol.” This extreme outlier value was excluded from the estimates in this table.